BACKGROUND PAPERS: THE COMMISSION ON THE FINANCING OF ELEMENTARY AND SECONDARY EDUCATION IN ONTARIO

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BACKGROUND PAPERS

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CONTENTS

Critical Issues in Education Finance in Ontario

Peter J. Atherton 1

Financing Primary and Secondary Education: Objectives and Means

D.A.L. Auld 145

Wealth and Tax Base Neutrality and the Financing of Education in Ontario

D.A.L. Auld 183

Cost Elements and Potential Strategies for the Application of New Information Technologies to Elementary and Secondary Education in Ontario

R.D. Hossack 203

Demographic and Economic Trends, with Consequences for Public Sector Education in Ontario

David Stager 253

CRITICAL ISSUES IN EDUCATION FINANCE
IN ONTARIO

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February, 1985

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TABLE OF CONTENTS

SECTION

1.0 INTRODUCTION 7
    1.1 Data Sources 11
    1.2 The Organization of the Paper 12
2.0 PRELIMINARY CONSIDERATIONS 15
    2.1 The Equity Issue 15
    2.2 Legal and Structural Constraints 20
        2.21 20
        2.22 England 24
        2.23 United States of America 29
    2.3 Comparisons and Contrasts: A Recapitulation 33
        2.31 Political and Traditional Factors 33
        2.32 Constitutional Factors 34
        2.33 Public Finance Factors 35
    2.4 Privatization 36
3.0 CRITICAL ISSUES: How Much Shall We Spend on Education? 41
    3.1 Expenditures in Canada and Ontario 41
    3.2 Where Has the Money Gone? 43
        3.21 Changes in the Level of Enrolments 44
        3.22 Changes in the Level of Prices 48
        3.23 Changes in Quality or Quantity 51
            3.231 Teacher Qualifications and Experience 51
            3.232 Changes in Pupil-Teacher Ratio 55

3.3 Problems of Salary Determination in Ontario 60

3.4 Problems of Economies of Scale 64

3.5 Marginal Costs and Revenue 66

3.6 Program Cost Analysis 68

3.7 Government Policies and Costs 71

3.8 Cost Controls 74

  3.81 Changes in Enrolment 74

  3.82 Changes in Price 75

  3.83 Changes in Quality and/or Quantity 76

3.9 Operating vs Capital Expenditures 79

3.10 Summary and Conclusions 80

4.0 CRITICAL ISSUE: How Shall We Raise the Money? 84

4.1 Current Distribution of Revenues for Education in Canada and the Provinces 84

4.2 Educational Revenues in England 87

4.3 Educational Revenues in the United States 88

4.4 Problems of Revenue Raising in Ontario 91

  4.41 The Property Tax 92

  4.42 The Administration of the Property Tax 95

4.5 Conclusions and Summary 101

5.0 CRITICAL ISSUE: How Shall We Distribute the Resources? 104

- 5.1 Resource Allocation Systems in Canada 106
  - 5.11 Highly Centralized Systems 106
  - 5.12 Partly Centralized Systems 108
  - 5.13 Decentralized Systems 110
- 5.2 Ontario Grant Structure 113
- 5.3 Critical Problems in the Ontario Grant Structure 114
  - 5.31 Adequacy of the Foundation or Ceiling Level of Expenditures 115
  - 5.32 Adequacy of Year to Year Adjustments 116
  - 5.33 Adequacy in Relation to Mandated Program Shifts 119
  - 5.34 Preservation of Equity 120
- 5.4 An Alternative System of Distribution - The Voucher System 121
- 5.5 A General Assessment 131
- 5.6 Summary and Conclusions 132

6.0 OBSERVATIONS AND SUGGESTIONS 136

- 6.1 General Observations 136
- 6.2 A Three Tier System 137

CRITICAL ISSUES IN EDUCATION FINANCE IN ONTARIO

1.0 INTRODUCTION

Since the conclusion of the Second World War and until the last four or five years, research and debate in Canada with respect to critical issues in educational finance have tended to focus on one or more of the following three major issues.

1) How much should we spend on education?
2) How should we raise the money needed?
3) How should we distribute the money?

The issue of how much we should spend on education was normally examined in the context of planning assumptions which took the objectives of the Canadian public education systems for granted. The curricular nature of educational programs was decided by provincial departments of education frequently operating on premises of educational theory, political expediency and/or the interests of professional and other pressure groups. Very often, and this will be the subject of later concern, little coordination between curricular developments and their associated costs was evident. As a result the critical question of how much should we spend was explored in only two major dimensions. The first was the traditional approach of projected enrolments within the parameters of compulsory education legislation and indices of participation rates for those whom education was to be voluntary within the public education system and multiplying the numbers so derived by a unit cost measure with implications for capital requirements spelled out. The second dimension of this approach was concerned with cost controls and factors which affected the measure of unit cost utilized in projecting total costs. Questions associated with both dimensions are still of critical importance but, it must be stressed, take place in the context of an assumption, seldom made explicit that the direct costs of public education should be met directly through the public purse. In Musgrave's terms (Musgrave, 1959) public education has been conceived as a 'merit want', a type of service which, although technically could be provided in the private sector and therefore not truly a "public good", had been assigned to the public sector because of its social and political importance.

In the last four or five years there has been a growth in the literature associated with the question of the extent to which education should continue to be a direct charge to the public purse and thus a fourth question might be added to the three questions originally proposed. "Should education continue to be a public or a private good?"

It will be appropriate to discuss this question later although there is little indication that the privatization of public education has become a burning issue in education finance for the public as a whole. To a large extent one must attempt to separate the issues involved. One should, for instance, try to decide whether the growing support to private schooling is a reflection of a desire to get government out of the business of financing education in principle, whether it is a reflection of a desire for increasing the degree of parental choice and control over the content and climate of the educational system; whether it results from a growing reluctance on the part of taxpayers to finance any government services from which they do not perceive themselves as deriving benefit; whether it results from economic concerns over distortions of resource allocation.

Before specific discussion of the issues involved in resolving questions associated with the level of expenditure on education whether privately or publicly funded, it is necessary to examine the concept of "equity." Different definitions of "equity" will lead to different conclusions concerning the level of expenditure and will also lead to different conclusions with respect to the systems or raising and distributing revenue. An attempt to deal with different definitions of "equity" and their implications will be dealt with in the next major section.

The second critical issue concerns the raising of monies needed. For many years this question has focussed on two major questions. First, there is the question of the division of responsibility among the levels of government for providing the level of financial support required. Second although usually connected with the first question there is the question of appropriate forms of taxation and revenue raising. Again it must be stressed that to some extent these questions are discussed frequently without formal acknowledgement of the assumptions, traditions and legal structures which govern the wider system of intergovernmental fiscal relationships. Since any recommendations for change based on practices in different jurisdictions must bear in mind similarities and differences to be found in such jurisdictions it is advisable that such similarities and differences be explored as a second preliminary consideration. This exploration will also take place in the next section.

The third critical issue concerns the distribution of monies raised. Historically speaking this involves the consideration of various approaches to grant systems. Once again it is important to note that such discussions are frequently based on assumptions not always made explicit. There is no question that the concept of "equity" held by policy makers will determine to a large extent the system of allocation implemented. For instance a concept of equality of educational opportunity defined in terms of providing equal access to education will tend to lead to a system which emphasizes equality of provision in inputs (equal dollars per student subject to minor corrections for geographic and structural differences). A concept of equality of educational opportunity defined in terms of opportunities required to provide equal results or outcomes will tend to lead to a system which provides different amounts of resources geared to compensate for differences in factors such as social class, innate ability and geographic location.

In terms of current visibility it would seem that the introduction of funding for separate high schools would be a critical issue. In spite of this it is not intended to deal specifically with this issue in this paper. In the first place it has been assumed that the issue of funding denominational education will be dealt adequately by the Commission currently set up to study its implementation or by the Commission on Private Schools. Even if this assumption were unjustified it is argued that the issue should not be dealt with separately. Many of the issues attached in the public mind to the funding of the separate school system are really general issues that are identical to those as they existed in the public system before extension. For instance, the problems of enrolment increase or decline, and staff shortages or redundancy whilst they may be sectarian in origin are problems with which the public school system has been grappling since the end of World War II. The problems of access to the property tax base experienced by urban separate school boards in practice can be considered as a problem of low assessment. There are many public school boards which do not have access to corporate or business property assessment. Such public boards, particularly when they are adjacent to large urban centres which serve as bedroom communities, have very similar problems to a separate school board located within the boundaries of the same urban centre.

For reasons such as these the problems associated with the extension of funding for separate schools will be dealt within the context of general funding problems.

1.1 Data Sources

Because of time constraints this paper relies heavily on data from research already published. Whenever possible, and when relevant, this data has been updated with the most recent statistics available from the Ontario Ministry of Education and Statistics Canada.

In some of the tables differences may be noted between Statistics Canada and the Ontario Ministry of Education for the same variables. Such differences arise out of time-lags in the reporting process and definitional differences between the two agencies. Caution should be exercised in direct comparisons between the two sets of data.

It is argued that the above limitations will not distort the observations and conclusions reported.

1.2 The Organization of the Paper

The paper will deal with the three critical issues raised in the previous section and with specific issues related to each of them.

Before dealing with the issues, however, it will be necessary to provide a discussion of preliminary considerations raised in this introduction. The first set of considerations is related to the equity problem. The second set of considerations is related to the structural and legal constraints which are associated with educational systems which might provide comparison and contrast for the examination of critical issues in Ontario. The systems selected for contrast are the English and American.

The discussion of the privatization issue will also be treated in this section. The discussion, however, acknowledge the limitations imposed by the existence of a provincial commission charged with the specific examination of this question.

Briefly then the outline of the paper will be as follows:-

1.0 INTRODUCTION
    1.1 Data Sources
    1.2 The Organization of the Paper
2.0 PRELIMINARY CONSIDERATIONS
    2.1 The Equity Issue
    2.2 Legal and Structural Constraints
        2.21 Canada
        2.22 England
        2.23 United States of America

- 2.3 Comparisons and Contrasts: A Recapitulation
    - 2.31 Political and Traditional Factors
    - 2.32 Constitutional Factors
    - 2.33 Public Finance Factors
- 2.4 Privatization

3.0 CRITICAL ISSUE: How Much Shall We Spend on Education?

- 3.1 Expenditures in Canada and Ontario
- 3.2 Where Has the Money Gone?
    - 3.21 Changes in the Level of Enrolments
    - 3.22 Changes in the Level of Prices
    - 3.23 Changes in Quality or Quantity
        - 3.231 Teacher Qualifications and Experience
        - 3.232 Changes in Pupil-Teacher Ratio
- 3.3 Problems of Salary Determination in Ontario
- 3.4 Problems of Economies of Scale
- 3.5 Marginal Costs and Revenue
- 3.6 Program Cost Analysis
- 3.7 Government Policies and Costs
    - 3.81 Changes in Enrolment
    - 3.82 Changes in Price
    - 3.83 Changes in Quality and/or Quantity
- 3.9 Operating vs Capital Expenditures
- 3.10 Summary and Conclusions

4.0 CRITICAL ISSUE: How Shall We Raise the Money?

- 4.1 Current Distribution of Revenues for Education in Canada and the Provinces
- 4.2 Educational Revenue in England
- 4.3 Educational Revenues in the United States

- 4.4 Problems of Revenue Raising in Ontario
    - 4.41 The Property Tax
    - 4.42 The Administration of the Property Tax
- 4.5 Conclusions and Summary

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- 5.1 Resource Allocation Systems in Canada
    - 5.11 Highly Centralized Systems
    - 5.12 Partly Centralized Systems
    - 5.13 Decentralized Systems
- 5.2 Ontario Grant Structure
- 5.3 Critical Problems in the Ontario Grant Structure
    - 5.31 Adequacy of the Foundation or Ceiling Level of Expenditures
    - 5.32 Adequacy of Year to Year Adjustments
    - 5.33 Adequacy in Relation to Mandated Program Shifts
    - 5.34 Preservation of Equity
- 5.4 An Alternative System of Distribution - The Voucher System
- 5.5 A General Assessment
- 5.6 Summary and Conclusions

6.0 OBSERVATIONS AND SUGGESTIONS

- 6.1 General Observations
- 6.2 A Three Tier System

2.0 PRELIMINARY CONSIDERATIONS

2.1 The Equity Issue

Whilst there is seldom a public debate over the question of what meaning of equity should shape policies of educational finance, policies which are implemented normally reflect an implicit concept of educational equity. While, generally speaking, there is little disagreement that all young people, within the limits set by compulsory attendance laws, should have equal educational opportunity, there is frequently disagreement as to what this means or how to implement it. More problematically for policy formulation, different individuals may hold different definitions of equality of educational opporunity (which may even be contradictory) and yet at the same time agree to support the concept. Wise (1968), for instance, has posited nine definitions of equal educational opportunity.

Since the purpose of this section of the paper is to provide a preliminary consideration of factors involved in the examination of critical issues, it is not proposed to review the extensive literature on equity in any detail. Nevertheless some specific observations on definitions and their funding implications are warranted.

Historically the emphasis on educational finance has been on the provision of horizontal equity which may be considered as the equal treatment of equals. Within this definition a number of approaches are possible. One can approach the problem by providing equal access to a prescribed minimum offering. This approach usually called the foundation approach is inherent in the system currently in use in Ontario whereby the 'ceiling' level of support is intended to reflect the expenditure per-pupil per year adequate to provide the minimum offering.

An extension of this approach is to provide equal resources to all students in attendance without any attempt to distinguish between basic and additional levels of education. This approach is characteristic of those provinces which provide full funding for school programs from provincial sources such as New Brunswick and Prince Edward Island. It was also characteristic of the percentage equalizing grant structure provided in Ontario from 1969-1977. In this case the definition of adequate program was left up to school boards with the province providing for a percentage of total expenditure which was inversely proportional to the wealth of the board.

In the 1950's and 1960's, and largely as a result of the recognition of racial and social inequality in the society as a whole, attention focussed on the inadequacy of defining resource allocation on the assumption that equal dollars would purchase equal educational opportunity. It became clear that the unequal treatment of unequals would be necessary to meet the goals of equal educational opportunity. This approach was defined as the vertical equity approach. In solving problems associated with the achievement of vertical equity it is necessary to focus on the needs of the student and to provide resources necessary to meet these needs.

In the context of a homogeneous society with relatively simple expectations from the educational system the need to provide vertical equity was seen largely in terms of providing weightings for geographic, demographic and economic factors which had cost implications. The need to provide for a programatic adjustment to achieve vertical equity was not seen as critical since high drop out rates and legal exclusion of students with special physical or other handicaps were acceptable.

For a variety of reasons there is now a heavy emphasis on individual differences, compensatory education and the special needs of handicapped children. This shift in emphasis suggests that there is now much greater need to provide for vertical equity in the system.

Systems which provide for vertical equity may be described as "minimum attainment" approaches whereby resources are allocated to every student until he reaches a pre-established level of achievement (grade level, skill etc.). A simpler approach to this problem is the classification approach whereby the need of students are classified then resources are allocated to meet their needs.

It must be admitted that the academic discussion of the problem of equity raises as many questions as it attempts to solve. The brief discussion above however does provide the basis for making some general observations respecting both the concept of equity itself and its application to the current Ontario system.

First it is apparent that the matter of equality of educational opportunity cannot be addressed adequately without reference to educational (curricular) issues. To address the problem solely in terms of fiscal equity is to ignore the issue of who is to be educated and to what level.

Secondly there is an implication that in the analysis of educational finance problems, there should be concern that the components should at least conform to complementary definitions or concepts of equity and avoid contradictory definitions.

Third there is an implication that discussions of the concept of equity should be pre-requisite to the analysis of any financial system.

The current structure of the system used in Ontario does not provide for an easy analysis. Basically the system may be thought to provide an example of the "foundation" approach described above in that it is intended to provide a basic minimum program. However there is little evidence that the "ceiling" amount which constitutes the foundation is based on a firm concept of what this amount will (or ought) to provide in educational terms. The inclusion of formula weighting factors for size and geographic location do tend to support the concept of horizontal equity but the lack of equalization for expenditures above the ceiling levels tends to act against the attainment of a high degree of horizontal equity. The Ontario grant structure also provides contradictions in the approach to vertical equity.

As noted, vertical equity requires that resources be allocated in accordance with classification of need. The current Ontario grant structure does provide for some classification of need. There are for instance formula weighting factors for compensatory needs of poor, urban, non-english or french speakers, and weighting factors which recognize the additional costs associated with technical education and French as a second language. Prior to the implementation of Bill 82 a form of classification existed in the form of weighting factors associated with special education. These weighting factors are now no longer part of the grant structure and the funds necessary to support special education are now included in the general foundation or basic ceiling amounts which tend to reflect average cost per-pupil across the system.

Increasing the provision for vertical equity has implications, in addition to those associated with changes in funding formulae. First, if we may assume for one moment that for any given year the total amount of money available for distribution to educational systems in the form of grants is fixed, then it follows that any process which provides more resources to some, must of necessity provide less to others. Thus, and in the light of the concern for control over costs and total expenditures, it may well be that increasing provision for vertical equity may pose increasing problems in the maintenance of horizontal equity. This problem may well become something of a political "hot potato" since one may expect to find the need for the widest variety of special services to be greater in urban centers than in the rural areas. Generally speaking parents with children with special physical, emotional or learning needs tend to move to the urban areas where a greater range of medical and non educational support services are available. It is in the urban areas that new immigrants with linguistic problems tend to cluster.

The effect of greater provision for vertical equity might well serve to increase the difference between urban average expenditures per student overall and rural expenditure per student overall. It is certainly true that in support of the somewhat draconian approach to cost control in British Columbia, the provincial government has noted the difference in levels of expenditure between the "extravagant" boards of the urban lower mainland such as Vancouver, and New Westminster, and the more "restained" levels of expenditure in areas such as the Okanagan Valley without any accompanying analysis of special needs to be found in the urban areas.

The relationship between total expenditures and the potentially high costs of implementing greater vertical equity has been expressed in indirect ways. For instance in Ontario the fiscal implications of the guarantee of almost open ended provision for those in need of special education expressed in Bill 82 was accompanied by a Ministry initiated program of "integrating" special education students into standard classrooms. Whilst the policy may well have been philosophically, psychologically, and pedagogically "sound" it is also true that "integration" also reduced the number of special classrooms with traditionally lower pupil-teacher ratios and more highly qualified teachers and made it possible for the province to eliminate special grants for special education.

However the increasing emphasis on vertical equity would suggest a continuous difficulty which may be associated with the problem of total cost. Given the context of fiscal restraint and the existing problems of coping with cost increases which to a large extend result from factors which lie outside the control of educational policy-makers, resources required to provide for an increased degree of vertical equity can only be obtained thorugh reallocation of resources now directed towards the achievement of horizontal equity. At a more fundamental level we may form the question, "Do we have sufficient resources both to maintain the class sizes in mainstream programs and to provide for the much lower class sizes necessary to provide adequate care and supervision for the mentally or the severely handicapped?" The answer to this question may well be determined by forces in addition to those usually associated with educational policy-makings as noted below.

2.21 Canada

Prior to the Constitution Act of 1982 the situation was relatively clear. By the British North American Act (Section 93) the provincial legislatures "may exclusively make laws in relation to education." Restrictions on legislative activities under the Act are confined to the rights of denominational or religious minorities. Although the Act makes no reference to the financing of education, the so called "Salmon Arm"[1] case found that where a province had legislated compulsory attendance it was the ultimate responsibility of that province to provide funding. Up until the passage of the 1982 Constitution Act, provincial governments could escape fiscal responsibility for the education of minorities except for religious minorities by excluding them from the effects of the compulsory school attendance laws.

Section 15(1) of the Act provides for "equal protection and equal benefit of the law without discrimination." Although the full implications of this section together with Section 23 which guarantees the right to educational instruction in a minority language, either English or French" where the number of those children so warrant", remain to be decided by the courts it is clear that there will be substantial financial implications. As Magnet has pointed out "The courts will now participate in setting priorities for the expenditure of public funds." (Magnet, 1982)

It may be suggested that the legal question will be particularly significant in the provisions for special education and funding arrangements for separate schools as well as for other minority groups.

The introduction of the courts into questions of equity and distribution now creates conditions similar to those which exist in the U.S.A.

For instance the whole question of excessive reliance upon a local property tax as an education revenue source which until the 1982 Act, was in Canada primarily a provincial political issue, may now become the subject of court action similar to that of the celebrated Serrano vs. Priest case in California where it was found by the California Supreme Court that the quality of a child's education may not be a "function of the wealth of his parents and neighbours."

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[1] McLeod vs Salmon Arm School Trustees, 4 WWR(NS) 385 [1952] 2 DLR 562(BCCA)

Court action in the U.S.A. is based on the 14th Amendment to the Constitution which guarantees equal protection under the law. After reviewing a number of cases affecting educational finance, Levin (1977) provided the following conclusions which are perhaps worth quoting at some length.

> It appears that school finance reform litigation based on the education and equal protection clauses of state constitutions will continue, although at a much slower pace than before, and with about a 50 percent success rate. The result -- if the past is precedent -- will be differing interpretations of equal educational opportunity, such as equal inputs, equal outputs (requiring varying inputs as needed to achieve the requisite outputs), a "basic" level of dollars, a "basic" level of educational resources at the varying prices needed to obtain those resources, a minimal level of "basic" skills (either input- or output-oriented), and so on.
>
> In addition, there will be increasing efforts to introduce into litigation the special needs of cities or of certain target groups -- such as the physically and mentally handicapped and the students of limited English-speaking ability. As the pressures increase at the state (and federal) level for categorical assistance to these groups, or for court orders extending education to those formerly excluded, or mandating "appropriate" education adapted to the need of previously inadequately served target groups, the amount of money available for general equalization reform will become more and more scarce.
>
> Levin (1977) p. 68

Among the unique features of the Canadian approach to intergovernmental fiscal relationships is the existence in Canada of the system of unconditional transfers made by the federal to the provincial governments. The effect of these transfers has been to provide some provincial governments with substantial non-provincial revenue sources to allocate to the public sector generally and therefore to education.

For instance Brown (1981) provides a table showing the relationship between federal revenue equalization payments plus lesser general purpose payments to the provinces as a proportion of combined provincial and local revenue for 1977.

Newfoundland	25.43%
Prince Edward Island	27.03
Nova Scotia	22.53
New Brunswick	21.32
Quebec	10.48
Manitoba	11.18
Saskatchewan	1.96

Source: Brown (1981) p. 163.

It is interesting to note that the provinces which receive the most are those which provide the highest proportion of provincial support to education regardless of grant structure. For instance Brown shows the level of provincial support for each Canadian province in 1977-1978 year as:-

		Rank
Newfoundland	91.60	2
Prince Edward Island	90.98	3
Nova Scotia	79.64	4
New Brunswick	96.44	1
Quebec	70.67	6
Ontario	59.36	8
Manitoba	48.36	10
Saskatchewan	56.67	9
Alberta	71.03	5
British Columbia	60.95	7

Source: Brown (1981) p. 74.

It is suggested that the revenue structure of provincial governments may have much influence in policies affecting the appropriate division between local and provincial revenue and discussion of an appropriate division (assuming there is to be one) should take this into account.

2.22 England

The system of financing education in England is, at first sight not radically different to that used in Canada. The total revenue for the school system is derived from two major sources: Grants received from the national government and property taxes (rates) raised by the local education authority.

Grants from the national government are received in the form of a Rate Support Grant which is intended to help defray the total cost of all local government services administered by the local government unit, in most cases the 'County'. The Rate Support Grant received by a local government is determined in accordance with its fiscal resources. The process of determining the grant begins with a negotiating process in which a wide number of inputs including qualitative information derived from school inspectors reports and consultations with local government officials are aggregated to provide a total expenditure at the national level. The process takes place within a carefully designed framework overseen by the Consultation Council on Local Government Finance.

The total amount of money set aside for distribution by the Council is based on the estimate of total recommended expenditure provided through the above process and the decision of the national government on the proportion of total expenditure it will support overall.

This sum is then distributed to local authorities through a percentage system inversely proportional to its taxable wealth, on the basis of a Grant Related Expenditure figure. The grant related expenditure amount may be compared to the ceiling figure in Ontario. The system is in fact very similar to that which existed in Ontario prior to 1977.

Perhaps the major difference in approach to the system used in Ontario is that provided by the existence of a planning stage through the Consultation Council which involves a high degree of participation. The process is concerned with qualitative as well as quantitative issues. Perhaps the closet that Ontario comes to providing a similar system can be seen in post secondary education. The relationship between the provincial government and the resource allocation system which it provides to the University system is moderated by the Ontario Council on University Affairs and the Council of Ontario Universities.

The need for a consultative planning approach to problems of educational finance may be viewed as a critical issue and will be discussed below in the section on distribution.

Another structural aspect of the British system has tended to be seen as attractive to north americans. The Education Act of 1944 allowed parents freedom of choice of schooling for their children insofar as possible. The freedom of choice was reinforced by the 1980 Education Act. As Judge (1984) explains, within certain necessary constraints parents are now allowed to choose a school, which need not even be within the boundaries of their own local authority. If they are not satisfied with the decision there is the right of appeal to formally constituted boards. Furthermore to enhance the principle of rational choice the Act requires the publication of information about schools - their polices, the curriculum and their examination results. The Act requires local education authorities to state the maximum capacity of each school and then fix a planned admission limit. Clearly this structure goes some way to meeting the demand for increased freedom of choice on the part of parents and the principle of accountability, currently emerging in North America as a major issue. To some extent the constraints proposed as a condition for the provision of funding to separate secondary school create the basis for such a freedom of choice.

It is therefore interesting to note Judge's reservations about the problem of providing choice in a period of contraction. He states

> As numbers in secondary schools fall, and as some schools continue to be more popular than others, it will be increasingly difficult to persuade parents that places are not available, when desks and rooms are empty. And yet, if some schools are filled to capacity, others will be perilously small, expensive, and inefficient. 'Consumerism' will widen the gap between good schools and bad schools, and make it more difficult for Local Education Authorities to plan rationally for the contraction of the system.
>
> Judge (1984) p. 187

A very significant difference between the English and the Canadian system is in the scope of the function of the local authorities. Unlike Canadian school boards, British municipal authorities are responsible for the full range of municipal services which is greater for both education and general services. Thus local education authorities in England have responsibility for technical colleges, colleges of arts, further education and teacher training. The municipal responsibility for social services also extends to such educational activities as adult training centers and community schools.

Educational services are administered by an education committee which is appointed from the general municipal council.

This structure provides for the possibility of coordination and integration of related services thus reducing the potential for wasteful duplication and intergovernmental rivalry which is posed by the Canadian and U.S. systems.

The Rate Support Grant, although calculated from estimates based on the costs of levels of service in different functions, is not tied for expenditure purpose to these estimates and thus the possibility of each authority developing its own combination of services is enhanced.

The "all purpose" local authority also tends to remove a source of continuing political tension which is often seen in Canada between the single purpose school board and the municipal government which raises the local contribution to education through property tax. It is a constantly recurring theme of municipal-provincial debate that municipal governments ought to be given the power to review school board levies on the assumption that school boards are somehow less fiscally responsible than their municipal colleagues.

Without attempting to resolve this issue it may be said that the English experience provides at least two important arguments which need response.

The first of these is that in England, the responsibility for taxation is dependent on the responsibility for administering the services. Municipal control over school taxation in Ontario without any responsibility for service would be no more rational than the current system.

Secondly in England the debate over the sharing of costs is focussed around the responsibility of those who have control over resources. In England the debate is between the national government and the municipal government. In Canada and Ontario the issue is clouded by the involvement of another form of local government. Thus it may well be that municipal concern over property tax in Ontario is more a reflection of the level of provincial contribution to total educational cost rather than a reflection of fiscal irresponsibility on the part of school boards.

It is interesting to note that in England the general concerns over local government funding are very similar to those in Ontario. For instance in a typical English County (Devon), in each year from 1974-1975 to 1983-1984, education accounted for close to 60% of the total municipal budget. During the same period the local taxpayers share of the total municipal budget increased from 37.4% in 1974-1975 to 51.8% in 1983-1984. This increase was reflected by an increase in local property tax rate of some 365%. This increase is very similar to that of the national average (Devon County Council 1983).

2.23 United States of America

Reference has been made above to some of the characteristics to the U.S. system insofar as the courts are concerned. There are, however, a number of other differences which effect financing.

The constitution of the United States does not allocate responsibility for education to the federal government. Legal responsibility, other than that associated with the equal protection amendment, is therefore a state responsibility. Both Canada and the United States early developed a system of local school boards. As Lawton (1979) notes however the local boards created in the United States tended to be more powerful inasmuch as they were responsible for both interna (teacher training, textbooks, curricula) and externa (salary costs, provision of buildings) whereas those in Canada were provided control over externa. Over time this has tended to leave American school boards with greater power, and state departments of education with less. In practical terms this power differential has meant that U.S. state departments of education have tended to use financial incentives (stimulation grants) as a means of implementing state policies. In Canada with strong departments and ministries of education the implementation of policy has been possible through legislation. Thus with the assumption of full responsibility for education finance in 1967, the province of New Brunswick was enabled to reform its school system totally without recourse to a complex system of grants and special payments.

Lawton (1979) has also stressed that differing political traditions in Canada and the U.S. have tended to support different approaches to the provision of equity in the funding of schools. He notes:

> The central value difference between English-speaking Canada and the United States, as far as political policies are concerned, appears to be the relative importance of achieving equality of condition among each nation's people. Canadians tend to place greater emphasis on equality than do Americans, who will tolerate a greater degree of disparity.
>
> As far as political processes are concerned, the central value difference is related to the individual citizen's desire for autonomy vis-a-vis government. Canadians tend to grant more authority to their provincial governments than do Americans to their state governments, or stated another way, Canadians are more tolerant of authoritative acts on the part of their governments than are Americans.
>
> Lawton (1979) p. 13

The results of recent gallup polls in Canada and Ontario with respect to the expectation of governments to bring about equality of condition seem to suggest that the above comments are still appropriate.

The significance of this discussion would appear more contextual than operational. Given the proximity of the two systems, and the greater availability of U.S. literature in Canada (to say nothing of U.S. influence provided indirectly through the education of graduate students in the field), Canadians very often tend to look to the United States for models and mechanisms.

For instance there is, in many states, a requirement to submit annual school board budgets for the approval of taxpayers. Although the results of this process have in some states, notably Ohio, resulted in obviously negative consequences for the school system such as closure of schools early because of lack of funds, there are suggestions that such a process should be introduced to Canada. Prince Edward Island, Quebec and Alberta provide for this type of control. The provisions however are seldom invoked possibly because of the more generous levels of support. The case is similar with respect to Proposition 13 in California. This amendment to the state constitution was a measure to limit access to the local property tax base. A number of Canadian writers at the time interpreted the limitation as indicative of a "taxpayers revolt." Instead, as American writers have since suggested the Proposition reflected public dissatisfaction with the relative share of municipal funding dependent on local taxation at a time when State revenues were providing for a substantial surplus.

A final observation must be made with respect to the concept of the "lighthouse school district." The term "lighthouse school district" was coined in the U.S. by Paul Mort in the 1930's to describe schools or districts which were considered to be those which could act as models of innovation and practice. To achieve these ends Mort and his associates believed that each district should have access to fiscal resources necessary to provide the basis for innovation. The provision for the development of the "lighthouse district" was considered an essential element of foundation plan design and it was in support of the aim that foundation plans normally provided that the local contribution to minimum level program would be set in such a way that school districts could, if they so wished, find resource to become "lighthouse districts." As Sjogren (1980) has noted, the definition of such districts has tended over time to reflect suburban districts often in wealthy or high socio-economic status areas which are "... characterized by high levels of the pupil expenditures and frequently high per-pupil property values."

The term "lighthouse districts" is used less frequently in Canada. The question of access to local resources however is usually considered essential in Canada for the maintenance of local control and local control is considered essential for the creation of "lighthouse districts."

It may be argued that the American solution to the problem of development of innovative models is not relevant in Canada or Ontario. As has been noted already the control in Ontario over curriculum rests with the provincial ministry of education. For instance the implementation of the reforms (innovations?) associated with O.S.I.S. will be accomplished through ministry regulation rather than the use of models as would be the case in the U.S.A. where control over curriculum rests at the district level.

One might question therefore whether additional resources for individual boards are necessary to provide for "innovation by legislation" particularly when as in the current system the resources are likely to be found without equalization of effort.

2.3 Comparisons and Contrasts: A Recapitulation

The previous sections have dealt in a general way with the provisions for educational finance in a general way in other provinces of Canada, in England and the U.S.A. In order to provide a more concise presentation for comparative purposes it might be appropriate to recapitulate the discussion under specific headings.

2.31 Political and Traditional Factors

Insofar as political and traditional factors effecting the financing of education are concerned, it might be appropriate to challenge the sometimes voiced position that Canada/Ontario occupies a type of middle position between Canada and the U.S.A.

In many respects the approach to funding reflects a quite different tradition to that of England and the U.S.A.

First there has been in Ontario a considerable emphasis in equality of condition which has resulted in the assignment to the provincial government for the responsibility of achieving it. In both England and the U.S.A. there is less emphasis on equality of condition overall and more on equality of opportunity at a basic level. This is more obvious in relation to curriculum than in financing.

Both England and the U.S.A. provide for wide differences insofar as equality of condition is concerned, particularly in the curricular dimension. In England each school determines the curriculum. In the U.S. the curriculum subject to very broad constraints is decided by each school board. In Canada the provincial governments to a very high degree determine the curriculum.

2.32 Constitutional Factors

Again to a large extent the constitutional dimension places Canada in a somewhat distinct position with respect to education funding.

In Canada the allocation of responsibility for education lies with the province. Although some modification of the sole right to make educational law is limited by the British North America Act insofar as denominational rights are concerned, and may be further limited by legal decisions arising out of Section 15 of the 1982 Constitution the line of responsibility is clear. The role of school boards and municipal governments in eduction in Ontario exists because of a decision of the legislature. As New Brunswick demonstrated in 1967, the whole structure of school boards could be eliminated by legislative acts.

No such clear line of responsibility is evident in the U.S.A. or England. Neither constitution makes mention of education. The British constitution is largely uncodified. Education is, in the United States constitution, not mentioned and is therefore a residual power of the States. Thus both the federal government in the U.S. and to a greater extent the national government in England have become involved in educational legislation and funding.

The direct involvement of the federal government in elementary and secondary education in Canada is possible. However, such involvement is largely in terms of cost recovery assistance for programs with a high degree of federal priority, e.g. Second Language programs. This is also a feature of

U.S. federal involvement but the added scope provided by court decisions, particularly with respect to civil rights issues widens the potential scope of U.S. involvement. Involvement of the national government in the U.K. is in accordance with the policies of the national government of the day since the national government is not restricted as to the scope of its activities in education.

2.33 Public Finance

The public finance system insofar as educational support of Ontario is concerned, is in many respects closer to that of the United States than of England. The funding of education in all three systems tends to be a shared responsibility between two levels of government. In England the national government with access to all sources of taxation shares responsibility with the municipal level whereas in Ontario and the U.S.A. the responsibility is shared between provincial or state and municipal governments.

The U.S. states and Canadian provinces have access to virtually all tax bases whereas the local governments are mainly restricted to the property tax.

Perhaps the most interest aspect of public finance in England is the provision for negotiation and analysis of the level of contribution of the respective partners in a somewhat less politically partisan arena than characterizes the process in Ontario or the United States.

The literature of all three countries reflects concern with the growing emphasis on the role of the property tax in educational finance.

2.4 Privatization

Generally speaking privatization of the school system is a growing issue in Ontario. It is not proposed to provide any lengthy discussion of this issue because of the ongoing work of a Royal Commission specifically designated to investigate the issue of support for private schools in Ontario.

Generally speaking however the resolution of the issue will have one of two possible consequences.

(a) That aid to private schools will be introduced.

(b) That aid will not be extended to private schools.

Since alternative (b) reflects the status quo it will not reflect on discussion elsewhere in this paper. Selections of alternative (a) will reflect on matters discussed later in this paper. Nevertheless it is appropriate that some attempt to assess the implications of the introduction of aid to private schools as it currently exists in Canada.

It should be remembered that the earliest schools in Canada were private schools, usually denominational. The earliest forms of aid provided from government sources to schools were therefore aid to private schools. The principle is not new or even relatively new to Ontario. Nevertheless it is generally speaking true that renewal of concern for the provision of funding to private education is a relatively recent event. Moreover it appears that concern in Canada tends to be inextricably connected with the denominational or religious issues rather than with the wider concern of parental choice which, in both England and the U.K., can be associated with economic, social class, race or philosophical issues.

For this reason it is not considered that the complete privatization of the elementary and secondary school system is a realistic possibility in the foreseeable future. The available evidence both in the form of scholarly writing and the results of recent public opinion surveys tend to suggest that Canadians, and Ontarians in particular, support the principle of equality of condition in the form of universality and accessibility which complete privatization would deny.

Five provinces of Canada, British Columbia, Alberta, Saskatchewan, Manitoba and Quebec already provide aid to private schools. In Manitoba and Saskatchewan the scope and extent of the aid is relatively minor. In the other three provinces both scope and extent are wider and therefore provide a basis for exploration.

Legislation enacted in Alberta in 1967 provides tax support to private schools on the condition that the schools have been in operation for three years, have at least two teachers with Alberta teaching certificates, teach the provincial curriculum, that the schools be open to regular inspection and importantly that the parents of students be Alberta residents. By 1980-1981 per-pupil grants had reached 70% of the basic per-pupil grant payable under the foundation plan.

Legislation in 1968 in Quebec extended support from public funds to all sorts of day, ethnic, private, parochial and independent schools. The grants can amount to 80% of the average cost per-pupil in schools where the curriculum coincides with the provincial ones.

In British Columbia private schools received public support in 1977 under less stringent conditions but the support is at the 30% level of the basic per-pupil grant. (Wilson and Lazerte, 1982).

The questions of the effect that provision for private schools has on education finance in the three above provinces is difficult if not impossible to estimate because of the number of extraneous variables involved. However an examination of total per-pupil expenditures in those provinces and Ontario shows that whilst Quebec, British Columbia, and Alberta ranked first, second and fourth in 1981, Ontario ranked third. (Brown, 1982 p. 12). Slim evidence to be sure but not enough to suggest a significant distortion of resources.

It would be expected that some local distortions might result, but it could be argued, these would tend to be problems associated with declining enrolments or growth.

The provision of aid to private schools might effect the distribution of costs between municipal and the provincial government since aid to private schools in Quebec, Alberta and British Columbia comes directly from the province, but again the evidence is not there. In 1981 Quebec provided 91.7 percent of all expenditures on elementary and secondary education from provincial funds, British Columbia provided 51.7% and Alberta 59.2%. In Ontario the provincial government provided 53.1%. (Statistics Canada, 1984).

This provides slim evidence to claim a shifting of burden for support of public schools. In terms of total expenditure, Quebec with the most generous provisions for support to private schools, provided $268,530 million out of a total expenditure on elementary and secondary education of $4,972,810 million or close to 5%. In Alberta, the next most generous in its conditions, aid to private schools accounted for $20,380 million out of a total expenditure of $1,473,949 million or close to 1½%. (Statistics Canada, 1984).

If it is assumed that any extension of aid to private schools in Ontario will follow the patterns in the province currently providing it, the foregoing discussion suggests that the issue of aid to private schools is more political and cultural than financial. This is particularly true in Ontario where the decision to extend public aid to the largest private school system in the province has already been made.

Perhaps one of the most cricial aspects of the privatization discussion is the need to separate the issue of parental choice in the content of the educational program and the issue of private funding. In England parental choice is provided for both inside and outside the publicly financed system suggesting that the one is not necessarily prerequisite to the other. This problem is discussed at greater length in Section 5.7.

REFERENCES FOR SECTION 2

Brown, Wilfred, Education Finance in Canada, Ottawa: C.T.F. 1981.

Devon County Council Revenue and Capital Budgets, 1983 County Hall, Exeter.

Judge, Harry, A Generation of Schooling, Oxford University Press, 1984.

Lawton, Steven B., "Political Values in Educational Finance in Canada and the United States", Journal of Educational Finance 5, (Summer 1979), p. 1-18.

Lewin, Betsy, "New Challenges in Educational Finance", Journal of Educational Finance 3, (Summer 1977), p. 54-69.

Magnet, Joseph E., "The Canadian Consitution: Implication for Education", The Canadian School Executive, October 1982, p. 16.

Musgrave, Richard A., The Theory of Public Finance, New York, McGraw Hill Book Co. Inc., 1959, p. 6-15.

Sjogren, Jane, "Assessing the Impact of School Finance Reforms upon Lighthouse School Districts", Journal of Educational Finance 6, (Summer 1980) p. 18-33.

Statistics Canada, Financial Statistics of Education, Ottawa 1984, Cat. #81-208.

Wilson, Donald J. and Michael Lazerson, "Historical and Constitutional Perspectives in Family Choice in Schooling: The Canadian Case", in Family Choice in Schooling, Michael E. Manley-Casimir (Ed.) Toronto: Lexington Books, 1982.

Wise, Arthur E., Rich Schools, Poor Schools, Chicago, University of Press, 1968, p. 134-159.

3.0 CRITICAL ISSUE: How Much Shall We Spend on Education?

This question may be examined in two ways: The first approach is to assume that the current provision of education service is adequate and to examine the problems of cost involved in providing this level of service in as efficient and effective way as possible. The second approach is to define the level of service desired and to cost out the resources required to provide it. Clearly no single approach is adequate. In this section the first approach will be used. The second approach will be dealt with section 5 of this paper.

3.1 Expenditures in Canada and Ontario

The latest data for which comparative data is available from Statistics Canada is 1982. Statistics Canada (1984) reports that in this year Ontario ranked fourth highest of the ten provinces in terms of expenditure per-pupil of $3,233.00 (p. 48). This information is not particularly informative in itself since it bears little relationship between expenditure and the ability of the jurisdiction to support such expenditures considered necessary.

A better basis for comparison is the level of expenditure as it relates to the ability of the jurisdiction to support such expenditures. Statistics Canada provides comparative data for expenditures as they relate to personal income and to gross domestic product, the provincial equivalent of a nation's gross national product. Gross domestic product is one of the most frequently used bases for expenditure comparison.

Table 3.11 provides details of these relationships.

TABLE 3.11

Expenditures on Education by School Boards in Relation to Personal Income and Gross Domestic Product Ontario and the Provinces 1982

Province	Total Personal Income	Rank	G.D.P.	Rank
Newfoundland	7.0	1	7.2	1
P.E.I.	5.8	3	6.4	2
Nova Scotia	5.6	5	5.8	3
New Brunswick	5.7	4	5.6	4
Quebec	5.9	2	5.5	5
Ontario	4.6	8	4.1	7
Manitoba	4.8	7	4.2	6
Sasktachewan	4.9	6	3.8	8
Alberta	4.4	9	2.7	10
B.C.	4.4	10	3.8	8

Source: Statistics Canada (1984) p. 50

The table shows that Ontario ranks eighth out of ten provinces in terms of the proportion of personal income devoted to the support of public education and seventh out of the ten provinces in terms of the gross domestic product. The high proportion devoted to education by the maritime provinces, and Quebec of both personal income and gross domestic product tends to be influenced by substantial federal unconditional transfers received by these provinces.

The rankings do not perhaps reflect the position accurately since the data relate total school board expenditures to the socio-economic indicators. The comparison therefore does not provide the relationship between total expenditures and the population being served.

Nevertheless when placed in the context of Ontario's fourth place in terms of expenditure per-pupil one can reach the general conclusion that

Ontario is providing for a relatively generous education system which is not making excessive demands on either the personal income of the province or its total economy as measured by the gross domestic product.

3.2 Where Has the Money Gone?

National comparison suggests that Ontarians should not be dissatisfied either over the level of service provided or by the sacrifice necessary to provide it. There is little doubt however that the public demonstrates concern over education costs and expenditures. This concern tends to be summarized by the observation "I am told that enrolments are declining and yet every time I read or hear anything about educational finance, I am told that we are spending more. Why is this?" Insofar as many of the public are concerned this is the critical issue. It is important that this issue be discussed fully.

Any change in the level of expenditures on education over time can be attributed to the effects of one or more of three sets of factors.

Changes in the level of enrolments. (3.21)

Changes in the prices of inputs required to provide services. (3.22)

Changes in the quality or quantity provided. (3.23)

It is important to point out initially that while to some extent these factors may effect each other there is no necessary causal relationship among them.

In order to examine the question of where the money went it will be necessary to discuss the effect of these factors in turn.

In the analysis of expenditure provided in this paper the "residual" approach is used. That is to say the paper will first look at total expenditures in elementary and secondary education in Ontario. Next the effects of changes in enrolment will be removed by expressing total expenditures in per-pupil terms. Third the effects of increases in the price level of educational inputs will be removed from the per-pupil expenditure data. Having controlled for these two sets of factors, the residual increase in expenditure is considered as resulting from increases in quality or quantity of the service provided. Controlling for the first two sets of factors is relatively easy; analysis of the residual is more difficult.

3.21 Changes in the Level of Enrolments

Table 3.211 provides details of enrolments in Ontario for the period 1970-1983.

TABLE 3.211

Enrolment in Elementary and Secondary Schools in Ontario 1970-1983

	ELEMENTARY		SECONDARY	
Year	Pupils	Annual % Change	Pupils	Annual % Change
1970	1,465,488	0.6	556,913	4.9
1971	1,456,840	-0.6	574,520	3.2
1972	1,445,101	-0.8	583,013	1.5
1973	1,422,885	-1.5	585,725	0.5
1974	1,404,839	-1.3	589,650	0.7
1975	1,389,478	-1.1	605,160	2.6
1976	1,360,085	-2.1	613,055	1.3
1977	1,329,396	-2.3	613,830	0.1
1978	1,290,337	-2.9	611,668	-0.4
1979	1,258,761	-2.4	600,084	-1.9
1980	1,240,274	-1.5	586,261	-2.3
1981	1,224,880	-1.2	568,635	-3.0
1982	1,217,412	-0.6	560,851	-1.4
1983	1,209,567	-0.6	544,930	-2.8

Source: Ontario Ministry of Education, Education Statistics Ontario, 1983.

The table shows that elementary population peaked in 1970 and began to decline at an accelerating rate throughout the following decade. The secondary school population peaked in 1974 and began to decline thereafter.

The decline is projected to continue in both elementary and secondary sectors. According to the Commission on Declining Enrolments in Ontario (1978) the decline is projected to continue until 1986 at which time enrolment will begin to increase until the end of the century. At the secondary level the projected decline will continue throughout the 1980's until 1992 when it too will begin to increase again.

In order to remove the effect of changing levels of enrolment it is usual to express expenditure data in the form of a per-pupil figure.

However, it must not be overlooked that the use of a crude, unweighted per-pupil expenditure figure overlooks the very real effect of changes in the enrolment pattern. It costs more to educate a secondary school student than it does an elementary student because class sizes are usually lower in secondary school reflecting the increased number of elective courses a student might take. Secondary school salaries are also usually higher than elementary salaries because secondary school teachers have higher qualifications and greater experience than elementary teachers.

Some measure of the difference in cost per-pupil is provided in Table 3.212 which provides details of the expenditure per-pupil in both elementary and secondary sectors.

TABLE 3.212

Elementary Public and Separate Per-Pupil Expenditures by Ontario School Boards 1971-1984 (Calendar Year)

Calendar Year	ELEMENTARY Expenditure	ELEMENTARY Annual % Change	SECONDARY Expenditure	SECONDARY Annual % Change
1971	$ 756	8	$1,303	4
1972	826	9	1,424	9
1973	877	6	1,479	4
1974	988	13	1,616	9
1975	1,217	23	1,841	14
1976	1,433	18	2,127	16
1977	1,595	11	2,344	10
1978	1,765	11	2,517	7
1979	1,945	10	2,752	9
1980	2,184	12	3,032	10
1981	2,512	29	3,476	15
1982	2,901	16	3,969	14
1983	3,219	11	4,332	9*
1984	3,462	8	4,648	7*

Source: Ontario Ministry of Education, Education Statistics Ontario, 1983, p. 21.

* supplied by Ministry: pre-publication data based on preliminary figures.

The table shows that the cost differential which may be thought of as a weighting factor varies through the period from 1.7 in 1971 to almost 1.3 in 1984.

The significance of the cost differential for total cost lies in the fact that the decline in elementary enrolment reported in Table 3.211 is offset by a steady increase until 1978 by enrolment in secondary schools. Because of the difference in enrolment patterns and cost differentials, the saving which might be expected from the decline have been less than crude enrolment statistics would suggest.

Nevertheless as Table 3.212 above shows expenditure per-pupil in the ten years increased substantially and so concern over the problem of cost control remains.

For most analytic purposes the use of an unweighted expenditure per-pupil figure is adequate to remove the effects of changes in enrolment.

Table 3.213 shows the effect of using a per-pupil base as distinct from a total expenditure base on the rate of change in expenditures in Ontario between 1970 and 1981.

TABLE 3.213

Rates of Change in Total Expenditure and Per-Pupil Expenditure
Ontario 1970-1981

Year	Total Spending ($ millions)	Spending Per-Pupil $
1970	1,735,748	910
1971	1,889,336	971
1972	2,043,591	1,044
1973	2,156,021	1,106
1974	2,450,085	1,271
1975	2,851,927	1,494
1976	3,344,136	1,754
1977	3,802,203	2,014
1978	4,062,477	2,176
1979	4,356,092	2,385
1980	4,765,444	2,672
1981	5,014,527	2,862
Average Annual Rate of Change		
1970 to 1975	10.44	10.42
1971 to 1975	10.84	11.37
1975 to 1980	10.81	12.33
1975 to 1981	9.86	11.44

Source: Brown (1982) p. 10, 12.

3.22 Changes in the Level of Prices

Accounting for changes in the price levels of educational inputs is more difficult. When we attempt to control statistically for changing price levels we are attempting to measure the effect of inflation. Given that the 1970's was a decade of high levels of inflation we are immediately aware a great deal of increase in school board expenditures was to offset the effects of inflation.

The normal measure of inflation is a Price Index. Price indexes measure the rise in price of a standard collection of goods or services at different points in time and express each price in terms of the price in the base year as a percentage.

The most commonly used price index is the Consumer Price Index which measures the price of goods and services consumed by average families. Given that most of the prices used by this series refer to food, clothing and accommodation, the C.P.I. is inappropriate to use for an assessment of the effect of inflation on educational expenditures. Fortunately Statistics Canada began in 1974 a price index for use in education. There is a separate index for each province.

The Education Price Index is based on the actual prices paid by school boards for the goods and services which are necessary to operate schools. The index deals only with current expenditures including transportation. There is another index series for dealing with the effects of inflation on school building construction.

Clearly the most important part of the Education Price Index is that which relates to teachers' salaries. The method of treating the price of teachers' salaries in the index is worth explaining further. It is common when discussion teachers' salaries to talk about the "average" teacher's salary. Such an "average" is normally obtained by taking the total salary bill and dividing it by the number of teachers employed. This average salary represents to a school board the average cost of providing teaching services. It does not represent the average price of teaching services.

The relationship between the notion of price and cost is made explicit in the following example. A teacher may receive an increase in salary from one year to another. The increase in salary is normally composed of one or more of three parts (a) an increase in the basic scale (b) an increase due to experience (c) an increase resulting from upgrading of academic qualifications. If the salary increase were due to an increase in basic scale only the increase would be regarded as a price increase. When the influence of qualifications and experience are added to the salary the increase results in a cost increase.

The Education Price Index is based on the year to year change of salaries for teachers possessing equal qualifications and experience. The significance of this discussion will be emphasized in the discussion of real expenditure.

Table 3.221 presents data on current and real expenditures per-pupil in Ontario from 1970-1981. The table shows that when the effects of price level increase are removed from expenditure per-pupil data the rate of real increase is substantially reduced from 214% to 232% or to an average of something like 2% per year. In fact it is possible to respond to the question posed initially with the statement "Almost all of the increase in expenditure in the decade of the seventies was taken up by increases in price level." It is worth noting in this connection that the increase in level of real expenditure in Ontario both in the 1971-1975 period and the 1975-1981 period is among the lowest in Canada. From data provided by Brown (1983) p. 13 Ontario ranked ninth out of ten of the provinces in the rate of real increase between 1971 and 1975. In the period between 1975 and 1981 the rate of increase in real expenditure was also ranked ninth out of ten. The rankings suggest that Ontario was extremely successful during the decade in controlling increases in expenditure.

TABLE 3.221

Current and Real Expenditures Per-Pupil
Ontario 1970-1981

Year	Current Expenditures	Real Expenditures
1970	910	-----
1971	971	971
1972	1,044	1,013
1973	1,106	1,035
1974	1,271	1,099
1975	1,494	1,131
1976	1,754	1,123
1977	2,014	1,187
1978	2,176	1,200
1979	2,385	1,227
1980	2,672	1,254
1981	2,862	1,204
Average Annual Rate of Change		
1971 to 1975	11.37	3.89
1975 to 1981	11.44	1.05
Total Increase 1971-1981	214.5%	23.9%

Source: Brown (1983) p. 10 and 13.

Although Statistics Canada does not provide expenditure per-pupil data for years subsequent to 1981, the annual changes in the level of the Ontario Education Price Index for 1982 and 1983 are available (Appendix 1, p. 139). Whilst for the years 1979-1982 the rate of growth in prices, particularly salaries, is below the Canadian average, the growth from 1982-1983 is considerably above the Canadian average.

3.23 Changes in Quality and Quantity

Before attempting to deal with the question of changes in the quality or quantity of education supplied it is necessary to provide a preliminary discussion of variables which increase expenditure but depend on assumptions as to whether they should be considered as increases in price level or whether they should be considered as improvements in quality.

These two variables are:-

Improvements in Teacher Qualifications and Experience (3.231)

Reduction in Pupil-Teacher Ratios (3.232)

3.231 Teacher Qualifications and Experience

The use of the Canadian Education Price Index statistically controls for changes in salary which are due to increasing levels of qualifications and experience. The real expenditure estimates provided in Table 3.221 are based on average costs which include the additional costs resulting from increasing qualifications and experience. Given the residual approach used in this analysis therefore, part of the increase in 'real' expenditures must be considered statistically as improvements in quality or quantity.

However before looking at this question in detail it is necessary clear the ground by responding to a concern which is sometimes voiced against the use of the Canadian Education Price Index for the purpose of this type of analysis. It is sometimes argued that estimate of real cost are artifically increased by the use of a price index heavily dependent on a teacher's salary sub-index, the movement of which reflects the strong negotiation position of teachers. In Ontario this question appears to have been particularly significant since 1975 when formalized collective bargaining was provided for in an atmosphere which may be described as heated.

One of the most difficult problems in assessing the impact of teachers' salaries is that of separating the effects of increases in salary resulting from collective bargaining and the effects of the changing levels of experience and qualifications. For instance, even if the negotiated salary grids were to remain constant over time, increases in experience and improvements in qualifications would result in increasing average salaries.

During the last half of the decade both experience and qualifications changed in Ontario. Between 1976-1977 and 1980-1981 the average age of elementary teachers increased from 35 to 37 and of secondary teachers from 38 to 40 [Statistics Canada, (1977) and (1982)] reflecting primarily the reduction in the number of new teachers entering the force. During the same period qualifications also increased. In 1976-1977 some 56% of elementary and 20% of secondary teachers were reported as having no degree (Statistics Canada 1977). By 1980-1981 the proportion reporting no degree had dropped to 37% for elementary teachers and to 14% at the secondary level (Statistics Canada 1982). Both sets of factors suggest that there would have been a considerable increase in average salary even had there been no negotiated increase.

There is one more factor effecting the level of qualification and experience in the system. Declining enrolments particularly in the latter part of the decade led to a reduction in demand for new teachers. Statistically the entry of teachers at the lowest point on the salary grid serves to depress the average salary for all teachers. As a consequence the increase in average salary for the latter part of the decade particularly is effected by the restructing of the salary structure of the teaching force since the proportion of teachers receiving maximum salaries increased.

Atherton (1983) after attempting through statistical analysis of the impact of increasing levels of qualification and experience on the Ontario teaching force since the introduction of collective bargaining in 1975 reported

> The analysis of teachers' salaries suggests that some 9-10% annually of the annual increase in per-pupil expenditure can be accounted for by negotiated increases in salary level, although a further 2-3 % can be accounted for by increases in average salary which reflect the increasing qualification and experience level particularly of elementary school teachers.
>
> Atherton (1983) p. 22

Another way of examining whether or not teachers used formalized collective bargaining to pursue an agressive salary policy to improve their salaries is to compare the gains of teachers with those of the working force at large

Table 3.231 provides details of the average weekly earnings in Ontario for the period 1974-1982.

TABLE 3.231

Average Weekly Earnings (Industrial Composite)
Ontario 1974-1982

Year	Weekly Earnings		Annual % Change
1974	$181		
1975	241		.33
1976	229		-.05
1977	249		.09
1978	264		.06
1979	286		.08
1980	311		.09
1981	348		.12
1982	382		.09
		AVERAGE	10.00

Source: Ontario Ministry of Treasury and Economics, Ontario Statistics, 1984, Toronto, 1984.

The table suggests that if the effect of increasing qualifications and experience estimated by Atherton is taken into account, the rate of increase in teachers' salaries over the decade, particularly the latter part of the decade is not out of line with the level of increase experienced by the Ontario Labour Force.

Some additional insights into the problem of teachers' salaries for the period prior to the introduction of collective bargaining have been provided by Stager (1978). After comparing the level of teachers' salaries with other wages and salaries in Ontario since the conclusion of the second world war he was able to conclude.

> The overall effect of these fluctuations was to leave secondary school teachers in 1975 at about the same relative salaries they had in 1951 at the beginning of the prosperous period. Elementary school teachers fared somewhat better: they were in 1975 at the same relative salaries received in 1957-1958.
>
> Stager (1978) p. 23

There is little doubt that the level and changes in the level of teachers' salaries have a major influence on educational costs. The above discussion suggests, in spite of the many charges and counter charges made by those who support or oppose collective bargaining in the educational sector, that although increases in qualifications and experience have accounted for a substantial part of the increase in average salaries, increases in the basic salary levels have not been out of line with the general increase in remuneration in the province.

3.232 Changes in Pupil-Teacher Ratio

Increase in real per-pupil cost as a result of decreases in pupil-teacher ratio are also reflected in the analysis as changes in the quality or quantity of service made available.

Unfortunately the meaningful discussion of pupil-teacher ratios is overshadowed by efforts to place blame. Lay people often charge that declining pupil ratios reflect efforts by teachers to make life easier for themselves and to protect jobs. Teachers defend declining pupil-teacher ratios as a means of improving the quality of education and as a means of offering additional programs. Historically research has failed to provide any definite answer to the question of pupil-teacher ratios and educational quality. In all probability both sides of the argument contain some truth.

The problem is further clouded by the frequent failure to distinguish between pupil-teacher ratio and class size.

The pupil-teacher ratio is most often used in assessments of resource allocation in education. The pupil-teacher ratio is derived by dividing the total number of students receiving service by the total number of certificated teaching personnel. The measure therefore includes all those who are in a non-teaching capacity whether for part or full time. Thus the pupil-teacher ratio includes not only consultants and central office personnel, but the time allocated within schools to support and administration. In the secondary school system particularly this would include full time or part-time principals, vice-principals, department heads, etc.

The class size on the other hand reflects the number of students who are receiving instruction by teachers. If there is a relationship between the quality of education and the allocation of resources it may be argued that the average class size better reflects this relationship. Unfortunately the evidence on this matter is far from complete. Perhaps Ryan and Greenfield (1975) best summed it up after a major analysis of the class size question in Ontario.

> There is no such thing as a small or large class. Because a 'small' class of 30 may prove to be as effective as a 'small' class of 20, it is obvious that the absolute size is not the vital factor. The opinion of the teacher is probably what determines 'small' or 'large'.
>
> Ryan and Greenfield (1975) p. 165

Interestingly enough while the Ontario Ministry of Education provides statistics on pupil-teacher ratios, both in full time and a full time equivalent basis, it does not provide data on class size. It is argued that the provision of such data in one form or another would not be impossible (it is available for British Columbia) and would provide a better focus for the quality class size issue as well as the question of the appropriateness of the proportion of teachers who are engaged in non-teaching positions.

However from a point of view of financing education, the examination of pupil-teacher ratios is worthwhile. Table 3.232 provides data on pupil-teacher ratios.

TABLE 3.232

Pupil-Teacher[1] Ratios in the Ontario Elementary and Secondary School System 1958-1983

	ELEMENTARY		SECONDARY	
Year	Full Time	Full Time Equivalent	Full Time	Full Time Equivalent
1968	26.2		16.6	
1969	25.3		16.4	
1970	24.7		16.5	
1971	25.0	23.4	16.7	16.5
1972	24.9	23.3	16.9	16.7
1973	25.1	23.4	17.3	17.0
1974	24.8	23.0	17.2	16.9
1975	23.9	22.0	17.4	17.1
1976	23.5	21.6	17.3	17.0
1977	23.4	21.3	17.3	16.9
1978	23.6	21.1	17.4	16.9
1979	23.5	21.0	17.4	16.7
1980	23.6	20.8	17.3	16.6
1981	23.2	20.5	17.1	16.4
1982	23.0	20.2	17.2	16.4
1983	22.8	20.0	16.9	16.1

Source: Ontario Ministry of Education, Education Statistics, Ontario, 1983.

[1] Teachers include all Principals, Vice-Principals, Heads of Departments and other non-teaching educational staff employed in the school.

The table shows that insofar as elementary pupil-teacher (full time) ratios are concerned the most significant reduction occurred between 1968 and 1975 when it dropped from 26.2:1 to 23.9. The pupil-teacher ratios for each of the years thereafter exhibit considerable stability even though enrolments continued to decline.

The decline in full time equivalent pupil-teacher ratios at the elementary level, particularly in the second half of the decade, reflects an increase in the proportion of teachers employed on a part-time basis. Atherton (1983) noted that there has been a steady increase in collective agreements at the elementary level which provide for release time for elementary school principals as well as preparation time for elementary school teachers. This may well be one administrative solution to the need to keep class size ratios within the limits negotiated through the collective bargaining process. It may also be an administrative response to the problem of maintaining specialized programs in a time of declining enrolments. What is reasonably clear, however, is that the decline had a significant impact on cost per-pupil. Since the decline was in the order of 10%, during the 1973-1980 period it is reasonable to suggest that the per-pupil cost will have increased by a similar amount during that period *ceteris paribus*.

The picture is similar with respect to secondary (full time) pupil-teacher ratios. The major reductions in pupil-teacher ratios were achieved at a time when enrolments were still increasing and prior to the introduction of formal collective bargaining. Furthermore the beginning of the enrolment decline is not reflected in a reduction in pupil-teacher ratio insofar as full time teachers are concerned.

In summary therefore it is possible to say that of the almost 24% increase in real per-pupil expenditures (Table 3.221) during the period, increases in teacher qualifications and reductions in pupil-teacher ratios accounted for most of the increase. An estimate has been provided that something like 10% of the real increase has been accounted for by a reduction in pupil-teacher ratios. Atherton's analysis (Atherton 1983) did not cover the entire period under study but a conservative extrapolation would suggest an estimate of as much as a further 10-12% of the increase was accounted for by increases in qualification and experience. These estimates would suggest that the question of the relationship between pupil-teacher ratios and qualifications of the teaching staff is a significant one in the area of cost control since charges in these two variables account for all but 2% to 4% of the increase in real expenditures over a ten year period.

One should comment here upon the role of the provincial government. The decade saw the introduction and development of a number of curricular changes which had an impact on costs. First, the increasing emphasis on minority language education was largely a provincial initiative. Although the funding system provided support for this initiative, this support is reflected in the residual estimate of increased real expenditure. More importantly the introduction of a vastly expanded provision for special education effected educational cost in two ways. In addition to the additional marginal costs involved in providing services directly, the new initiative required that substantial numbers of teachers were required to undertake additional education at the University level thus serving further to increase the average salary of teachers as well as having an impact on the University funding picture.

It is not at all clear that provincial curricula initiatives in Ontario implemented through legislation or regulation are paralled by thorough assessments of costs. This problem may be less significant in England where the council includes this discussion in its negotiations in the establishing of grant support, or in the U.S. where innovation is encouraged through stimulation aid.

3.3 Problems of Salary Determination in Ontario

The question of the relationship between quality and the level of teacher qualifications and experience is especially significant in Ontario where qualifications and experience influence cost so significantly. For example, given the same pupil-teacher ratio it was possible for the teaching cost in two secondary classrooms next door to each other in 1984-1985, in a typical jurisdiction in Ontario (Niagara South Board of Education), to vary from a low of $19,932 for a beginning teacher with basic qualifications to a high of $44,475 for a teacher with maximum qualifications and experience. It would be difficult to justify such a range of production cost in business. This is particularly true when one considers that there is no expectation that the quality of education afforded by the lower paid teacher is in any way less than that afforded by the higher paid teacher. Nor, it should be emphasized, is there any formal expectation that the role of a teacher should vary in accordance to the salary level.

Teachers in Ontario are remunerated in accordance with the approaches used generally throughout Canada. Teachers are paid according to a "grid" which provides for additional increments for both qualifications and experience. It was not always so. Knezevitch and Fowkes (1963 p. 400) note that "Salary schedules for instructional personnel are a twentieth century phenomenon." They became widely used, particularly after the second world war as a means of attracting and retaining well qualified teachers at a time of shortage of teachers and limited opportunities for formal education. It is not so long ago that teachers were admitted to practice in Ontario after preparation periods of as little as six weeks.

The situation is now clearly different and thus one can question the continuing need for an incentive system which reflects the earlier situation.

It is arguable that the system of remuneration should provide for recognition of experience up to a certain level. Such a system is characteristic of remuneration systems in the service and administrative occupations whether they are in the public or private sector. In addition to the incentive aspects of such a system, the provision of experiential increments does not provide difficulties for cost control or projection.

Recognition for additional levels of education is a different matter. For one thing given the difficulty of establishing the relationship between additional qualifications of education and quality of teaching performance it is next to impossible to determine an equitable reward for having pursued further study. Secondly and more importantly, since additional qualifications or eduction reflect largely the individual teacher's decision to pursue further study, it is doubtful whether employers should be forced to pay for it unless they consider it to be part of their system design overall. Thirdly although it may be argued that, (even accepting the quality/education assumption) those who pursue further are entitled to some return on their investment in education there is little indication that the additional salary received bears any relation to the investment involved.

This is particularly true when one introduces the social cost estimate to the calculation. In times when opportunities for formal continuing education were limited, the private costs of further study usually involved substantial indirect costs for relocation and even more substantial opportunity costs since educational opportunities were primarily restricted to full time students. With the expansion of opportunities for part-time studies including graduate work, the addition of local centers for such part-time study and the increased degree of subsidization of post-secondary costs by the government, the private costs have tended to come down and the social costs go up. Thus it is difficult to argue that the costs of obtaining further studies are a reflection of their economic cost in any systematic way. Finally it may be argued that the provision of automatic increases for additional qualifications, and the fact that decisions to pursue such further studies are largely the result of individual decisions mean that projections of educational costs are not possible over the medium or long term and thus serve to distort the allocation problem.

Since, by and large, the systems of salary determination in the rest of Canada and the U.S. are similar to those used in Ontario it is difficult to identify useful experience for comparison from these jurisdictions.

Perhaps the English experience is more helpful. In England a salary scale is negotiated at the national level by the so called Burnham Committee.

The scale essentially recognizes only qualified or non-qualified teachers. Qualified teachers are those who possess the minimally accepted qualifications. Unqualified teachers are those who do not. The scale makes provision for annual increments. The scale also recognizes the completion of additional qualifications to the basic level by providing an additional annual allowance which remains the same over the range of experience. There is provision for movement to a scale higher than the basic qualified teachers' scale. These scales however are applicable only to positions of "added responsibility." To be moved to such a scale a teacher must be exercising additional responsibility in a teaching or administrative capacity. If one assumes that a pre-requisite to an appointment of added responsibility is additional qualification then this approach recognizes a role for continuing studies but only when their achievement is accompanied by the exercies of a more specialized role in the school. The phenomenon of a teacher moving from minimum to maximum across the whole range of the salary grid whilst staying in the same classroom teaching the same subject would not be possible in England.

Generally speaking the additional qualification which entitle the teacher to the "bonus" are academic. The English local authorities provide for a wide range of continuing education opportunities through their budgets. Such continuing education does not qualify for increased salary directly, although work in a specialized area may qualify a teacher for a post of "added responsibility."

The number of positions of added responsibility in a given local authority is subject to negotiation within the constraints of upper and lower limits determined by the central negotiating committee.

3.4 Problems of Economies of Scale

The problem of economies of scale has been of continuing interest in educational research. Initially the topic was of interest since it was thought to support plans to centralize schools and school districts. Since enrolments in North America began to decline in the early 1970's the question has tended to focus not on the economies to be derived from the increasing size of schools and districts but rather of the diseconomies associated with smaller student populations.

Dawson (1978) in a paper commissioned for the Commission on Declining Enrolments in Ontario summarized past studies of economies of scale. He says

> In general, these studies divide themselves between studies of school boards (companies) and school (plants) in various jurisdictions. Unfortunately, most fail to allow for differences in school quality. Generally, the results indicate that at the board level there appears to be evidence of economies of scale up to a point. At the school level the evidence is much more positive in exhibiting the existence of economies of scale. Conversely, and more importantly for the purposes of this paper, it should be noted that this implies that as schools become smaller there are large diseconomies of scale after enrolment declines past the minimum efficient scale.
>
> Dawson (1978) p. 7

Included in Dawson's paper were the results of a study conducted in Ontario which attempts to relate size and quality by using a measuring of quality (average daily attendance adjusted by school ratings) derived through SACU (Service for Admission to College and University) tests. While the results of his study indicated economies of scale at the secondary level for boards up to a size of 4,000 pupils, the findings for boards with enrolments beyond the 4,000 size depend on whether one uses basic A.D.A. as the measure of output or whether one uses the quality adjusted measure (SACU tests).

He states "The raw data indicated some diseconomies of scale beyond the 4,000 pupils level." The quality adjusted data suggest constant returns to scale. At the elementary level little evidence of economies of scale was found. (Dawson, 1978, p. 26).

A more recent study by Coleman and La Roque (1984) focussed on economies of scale and school district cost in British Columbia. Since their research was directed toward policy formulation the report of their results have relevance for this paper.

They reported the following broad conclusions:

(1) school district amalgamations to increase average size will not result in economies of scale and reduced costs per pupil, although they will conceal high costs;

(2) attempts to control district per-pupil operating costs should focus on teacher salaries, and on the joint variables of mean school size and PTR; and

(3) small school districts are faced with an unalterable variable, small and remote schools, which has a dramatic impact on their gross operating costs. The most recent district financing system, intended to remain in force through 1986, will effectively create a two-tiered schooling system, with most small districts providing very minimal services, by comparison with those available in larger centers.

Coleman and La Roque (1984) p. 34

They emphasize the significance of these conclusions by noting

> For provincial policymakers, mean school size in small districts has to be considered, by and large, as an unalterable variable. It becomes an important consideration, not in cost control, but in equitable funding of school districts.
>
> p. 34

It is suggested that the above implication may be very important for Ontario policymakers if it is considered that in addition to the geographic basis of definition of small district size, there is also a denomination basis. Thus many separate school systems may be described as "small" even though they are located within more heavily populated areas. The provision of funding for separate high schools is likely to exacerbate any problems of equity.

To some extent the problems of economies of scale are associated with two other issues equally critical. There are the problems associated with marginal cost and revenue, and the problems posed by program cost analysis or rather the lack of it.

3.5 Marginal Cost and Revenue

The demonstration of economies and diseconomies of scale in education is based on the hypothesis that *ceteris paribus* the cost per-pupil in larger schools will be lower than that of small schools. By extension this suggests that increasing the size of schools or systems will reflect in declining marginal cost. That is to say the actual increase in cost to a board of adding one more pupil to each class in the boards jurisdiction will be lower than that reflected by the average cost which is a compulational statistic. In practice it is considered unlikely that the board will need to allocate substantial additional resource to provide for that student.

In cases where the number of students decline the reverse would be true. The marginal saving of withdrawing one student would amount to less than the decline reflected by the average cost.

This observation is of significance when it is related to the system of grant revenue. If grants are paid on a per-pupil basis then a board will receive an unexpected windfall in times of increasing enrolment because the grant per-pupil will be significantly greater than the actual marginal cost per-pupil incurred by the board. Similarly in times of decline the actual savings accruing to the board will be less than would be reflected by the loss of the per-pupil grant.

One might argue that this phenomenon in times of increasing enrolment provides boards with additional resources to improve program without necessarily accessing their own resources, whereas the same board cannot even maintain the same level of program without accessing their own resources in times of declining enrolments. It is further argued that time phenomena might be of increasing importance following the funding of separate high schools if this has the effect of changing the levels of enrolment in the two systems.

Interestingly enough substantial increases in the level of per-pupil grants would serve to widen the gap between marginal cost (the actual saving or extra cost to the board) and the average revenue (the per-pupil grant).

There is need to provide for some recognition of this phenomenon although no reference can be traced directly to the problem of marginal costs and revenues in Ontario. It may be noted that there was a grant weighting factor for declining enrolments in the Ontario grant structure provided at the time of introduction of the current system. It was also provided for in Manitoba and to some extent in the systems used in British Columbia. It should also be noted that correction is provided for in the current system of University financing. The role of base-year funding and discounting for increases or decreases in enrolment must be considered in the light of the concern for marginal cost and marginal revenue.

One of the problems which could effect the problem of policy making in this area also effects other dimensions of the general problem of financing education. This problem is the role of program cost-analysis.

3.6 Program Cost-Analysis

The problem of providing for horizontal equity in a funding system can be solved to some extent by making the basic grant sufficiently generous allowing for expenditure differentials necessary to provide for vertical equity. In times of economic constraint it is necessary to be more exact in defining areas of need and appropriate levels of financial support.

The current debate over universality in social transfers and over accessibility and funding of post-secondary education are different manifestations of this concern. One of the difficulties inhibiting detailed study of the problem in public education is the absence of program cost-analysis.

In the early 1970's Ontario attempted to introduce "ERAS" (Educational Resources Allocation System). This system was intended to be an approach to school budgeting in Ontario using elements of program budgeting. The approach required an analysis of programs offered in schools, an estimate of their costs, and an evaluation of the results of these programs in terms of their budgetary allocation. The Ontario ERAS system followed attempts in Alberta to introduce a program budgeting system in that province.

The ERAS system in Ontario was never fully implemented partly because of the decision to make program evaluation and program costing go hand in hand. In Alberta, program costing was perceived to the first step and as such did not fact the difficulties the Ontario approach did.

The extent to which the systems of budgeting used in Alberta approaches the ideals of program budgeting is not an appropriate subject for discussion in this paper. What is important however for the purpose of this paper is to note that the Alberta system through a "Program Accounting and Budgeting Manual" provides a model for program cost-analysis in all jurisdictions. This system permits access to a flow of data which can be used to provide information at all levels in the school system with respect to costs and the programs which they support.

Since the manual is lengthy and detailed it is proposed to provide only a brief example of the information the system requires and the uses to which it may be put.

One of the more important sources of information in this system is the Faculty Workload Survey. The information required for the survey may be derived from direct (teacher) sources or indirect (Principal or Ministry Reports) but the prescribed format is designed to provide the following data.

(a) the individual's basic salary;

(b) the amount and type of any special allowances paid to the individual over and above the basic salary;

(c) the experience and training of the teachers;

(d) the identification of the school and the teacher;

(e) the identification of specific courses or activities;

(f) the number of different courses taught and/or activities performed by the individual;

(g) the identification of the grade, or special education nature of the course;

(h) the identification of the course organization (single-grade class, double-grade class, etc.);

(i) the identification of the length of the term for which the course is provided, whether full year (10 months), semester, trimester, or quarter;

(j) the identification of the number of credits associated with senior high school courses and activities;

(k) the length of time in minues per week in which the individual is directly involved in each course or activity;

(l) the enrolment of each course or activity which involves students.

> The form is designed with two sections to facilitate accuracy, simplicity of completion, and direct transfer to data cards for computer processing. Instructions for the survey administrator and staff are provided along with the form, as well as a complete listing of the courses and activities, and their appropriate codes.
>
> Alberta Department of Education (1972) p. 94

The manual goes on to describe possible uses of the workload survey.

> Analysis of the Faculty Workload Survey entails two distinct phases. First the reported data can be descriptively analyzed to describe the situation, to determine significant differences either in the cost or non-cost categories, to identify patterns, and to isolate problem areas and areas of concern. The first phase should also identify the variables which interact to form these patterns, problem areas, areas of concern, or areas of difference. These variables, however, become more meaningful when time-series figures are considered rather than cross-section, or "one-point in time" figures. Comparisons between and among related dollar and non-dollar variables would indicate whether differences are marked, and whether patterns and areas of concern exist. This in turn would indicate a need for further anlaysis. Patterns become evident when some variable increases, remains constant or decreases in other figures being higher or lower than anticipated, or higher or lower when compared to another school or system.
>
> Alberta Department of Education (1972) p. 96

Whilst Ontario does provide cost-analysis through Ministry of Education research contracts these reports do not provide for an overall data base upon which to make systematic recommendations because they are not systematically organized and do not use a single model as a basis for methodology.

One can recognize the expense necessary to implement such a system of cost-analysis. Nevertheless the case must be made that it is not possible at this moment to get an answer to the question "How much are we spending on Special Education?" or even "How much are we spending on the teaching of Reading in the Elementary Schools?" Failure to provide data on questions such as this, it may be argued, will result in a continuing narrow approach to the question of education finance in Ontario. Our current approach concentrates only on inputs and the costs and the movement of such costs. Through this approach we can respond in a very limited way to the question "How much shall we spend on education?" We tend to be limited to three possible responses (1) too much (2) too little (3) just enough. In the absence of data relating costs to outputs the section of the most appropriate of the three alternatives may be decided by gallup poll or majority vote. Without denying the legitmacy of the political process reflected by this approach one can urge the inclusion of a higher degree of rationality into the decision-making process.

3.7 Government Policies and Costs

One of the most critical issues in funding is the relationship between governmental initiatives in curriculum and costs.

To a large extent this issue has been touched on in previous sections.

Nevertheless it is considered so significant an issue as to bear some restatement.

During the 1970's at least two of the major variables which effect cost were, to a substantial degree effected by government policy. The provincial government increased the minimum entry requirement to the profession to a minimum of four years of post secondary education. In addition to effecting the salaries and therefore cost of new entrants to the school system, this decision encouraged those with less than minimum to increase their formal qualifications even though their teaching competence had not been questioned.

Secondly the provincial government provided by legislation the framework within which collective bargaining took place. The scope of the school boards and Teachers' Collective Negotiation Act of 1975 provided in section 9 that "Negotiations shall be carried out in respect of any term or condition of employment put forward by either party." Although research (Atherton, 1983) has suggested that freedom has not had major impact on cost per-pupil, it must be acknowledged that further research is needed before closure can be made. Certainly experience in individual boards may not bear out the conclusions reached by Atherton who used data aggregated at the provincial level and therefore lost the significant experiences of individual boards.

Curricular developments including provision for special education and French as a second or first language were also largely provincial initatives. There is little evidence that the financial impacts of these changes were seriously researched any systematic way by the Ministry. One might therefore be forgiven for expressing concern about Ministry policies which might extend the range of educational program offering as the result of recommendations of the current Government Task Force examining the provision of early childhood education. This will be especially true if it is not charged with providing cost estimates together with the recommendations.

It would be totally inaccurate to infer that no attempts have been made in Ontario to relate educational finance to significant issues in the provision of educational services. Rather it is contended that such attempts tend to be a response to crises and are handled in an *ad hoc* fashion.

While aspects of the funding problem were dealt with by the *Commission on Declining Enrolments* and *Commission of Inquiry Regarding Small Secondary Schools in Northern Ontario* and by papers prepared for these commissions, there is need for a continuing analysis of educational problems as they effect funding. Such an analysis should not be conducted by the Ministry alone nor should it be restricted to the occasional and *ad hoc* analyses provided for by the academic interests of individual researchers.

Preferably it should be provided by an independent unit staffed by academics and professionals seconded by their employers. The unit should be associated for administrative purposes with an independent university or non profit organization with guaranteed access to data from school boards, municipal organizations and other groups. This unit might also provide data for the body responsible the consultative process suggested above and modelled on the English approach. The existence of the Minister's Advisory Committee on grants is acknowledged and nothing in the above discussion argues for its replacement. Rather what is being suggested is an autonomous body responsible for the ongoing analysis of problems in educational finance which might well provide much of the data upon which the committee bases its recommendations.

3.8 Cost Controls

Thus far this paper has suggested that Ontario has during the 1970's, done relatively well in controlling the increase in costs which characterized the national scene. To explore further the problem of cost control however would be appropriate in the event that the current approach may be changed.

Given the three sources of cost increase provided on page 37 it might be useful as to how the concept of control could be applied to each.

3.81 Changes in Enrolment

The only method of controlling costs through enrolments would be through limitations placed on accessibility. These might take the form of reducing the compulsory attendance age although the retention of high school students in a time of reduced economic activity does not argue well for such a program. Restriction of access to particular programs might well serve to reduce total cost although the absence of program cost data makes this approach somewhat risky. Furthermore the potential for restrictions which might be imposed by the Constitutional Act would suggest that increasing numbers of students will need to be provided for in such areas as French or Special Education.

Generally speaking reductions in accessibility would not appear to be a feasible approach to cost control. Nevertheless a continuing decline in enrolments will offer a natural cost control although it is almost a foregone conclusion that the decline in cost will not be directly related to the decline in enrolment because of the other problems discussed above.

3.82 Changes in Price

Although the price of teaching service is the major component of educational cost it must be recognized that price level increases effect other components. Certainly in the decade of the 1970's the increase in prices of other components outstripped the increase in price of teaching services particularly when one separates out the cost of increases in educational attainment and experience.

The dependence of the price for other inputs on general market conditions cannot be ignored, and the only way to control the increase in such costs is to intervene in the market either through subsidy or regulation. Controlling the costs of heating and transportation of fuels or other materials consumed by schools would assist greatly but would soon be followed by equally persuasive arguments from others in the public sector. It would be reflected directly or indirectly as an increase in the provincial contribution.

Controlling the price (as distinct from the cost) of teaching services means interfering with the collective bargaining process put into effect in 1975 and might be subject to challenge under the Section 15 of the Constitutional Act unless similar structures were proved for in other parts of the public sector. Certainly British Columbia has not hesitated to introduce stringent controls on salary negotiations but in the context of constraint throughout the public sector. Furthermore it has been stressed (by the Government, at least) that such controls are viewed only as a temporary measure in response to an extremely poor performance of the British Columbia economy as a whole.

Insofar as controlling the costs of teaching service are concerned it would appear to be feasible to introduce a system which reduced the non-negotiable proportion of teacher cost which arises out of the current system of providing increments for increasing in qualification the attainment of which result from employee rather than employer decisions. Whilst it would be difficult to provide for this through legislation or regulation it might be effective to withdraw any recognition in the grant structure for systems which have above average experience or qualification.

3.83 Changes in Quality and/or Quantity

It has been shown that declining pupil-teacher ratios have also been significant in effecting the increase in educational cost although it is difficult to say definitely whether this is a price or quality question.

The current per-pupil ceiling figure used in Ontario includes a implicit definition of pupil-teacher ratios considered appropriate by the province this ratio is however distorted by the inclusion of weighting factors which provided "hypothetical" enrolments and therefore pupil-teacher ratios different to the norm. The use of implicit teacher-pupil ratios permits local administrators to adjust ratios in accordance with the costs of providing teaching service and in line with the needs of the system. Theoretically this approach provides administrators with the flexibility to trade-off higher than average salaries for higher than average pupil-teacher ratios. Failure to maximize the potential trade-off will result in costs increasing beyond the ceiling figure and thus there will be an increase in the amount to be raised through unequalized local taxation.

Unfortunately it is difficult in practice to distinguish whether accessing the local tax base is the result of inadequate provincial ceiling figures or failure to maximize trade-off potential in negotiations. If control over pupil-teacher ratios is desired it might be possible to make more explicit provincial intent by changing the "per-pupil" basis of grant to a "classroom unit." The size of the classroom unit would be determined by a recognized pupil-teacher ratio.

The grant would be calculated by dividing the total enrolment by the size of the defined classroom unit. Another dimension of cost control is an approach through centralized budget control. Although on surface the institution of strong central controls would suggest that control over the rate of increase of educational cost would be possible, the evidence is not strong. Both Saskatchewan, Alberta and British Columbia during the period 1975-1981 provided for expenditure limits based on previous years' expenditures level and increment for increasing price levels. Both Quebec and New Brunswick provided a very high degree of central provincial control over budget preparation through specific regulation.

Between 1975 and 1981 the rates of increase in actual per-pupil expenditure in Canada were as follows.

	Rate of Increase	Rank
Newfoundland	11.78	6
Prince Edward Island	9.64	10
Nova Scotia	12.94	4
New Brunswick	12.95	3
Quebec	16.18	1
Ontario	11.44	8
Manitoba	11.76	7
Saskatchewan	13.88	2
Alberta	11.12	9
British Columbia	12.15	5

Source: Brown (1983) p. 12

The data suggests that provinces identified above as providing varying degrees of strict controls over expenditure did no better than Ontario during this period in holding down the rate of increase in expenditure. New Brunswick and Quebec with much higher degrees of centralized control were less successful in controlling increasing expenditures than Ontario.

The even more rigid system of expenditure control which the British Columbia government introduced in 1982 has made an immediate impact on costs. It is worth noting however what Anderson (1983), one of the designers of the system, had to say in this connection. He noted

1. As yet the extent of required reductions is not clear. As a result, there has been little public pressure to alter the *status quo*. This might well change if boards were forced to lay off significant numbers of teachers, but to date there has been great reluctance on the part of boards to make unnecessary lay-offs and to move too hastily in reducing staff size.

2. Estimates of the size of the provincial deficit have continued to grow. The 1982-83 estimates called for a balanced budget. However, by December, 1982, revenue was down $412 million and expenditures down only $27 million. The budget deficit was projected at $500 million and likely to grow. This outlook made for pressure to reduce expenditures to as low a level as possible.

3. Boards have been very good at keeping the public calm over the situation. They apparently assumed that, in the end, the lay-offs and resulting turmoil which would emerge from initial target budget levels would be unacceptable and that budget limits would be increased.

Anderson (1983) p. 26

The principle difficulty posed by the introduction of most regulatory controls is that the fiscal targets tend to deal with average levels of expenditure. Decisions to fund at the average level tend to penalize those for whom geography, demography or social need, require expenditures above the average, in order to provide for vertical equity. At the same time this approach provides an unanticipated bonus for those who for one reason or another spend below average amounts. At this point it is appropriate to refer back to the conclusions of the Coleman and La Roque study (p. 59) which reinforce the comments above with respect to potential areas of cost control.

Given the Ontario experience with cost control it may be highly debatable whether the introduction of further and more stringent mechanisms into the current system would be more effective. Under the conditions of radical change it might be possible to effect such mechanisms.

3.9 Operating versus Capital Expenditures

No attempt has been made in this paper to deal with the problems posed by the funding of new construction. Given the picture of declining or stable enrolments facing the system as a whole, it is considered that funding capital construction is not currently a critical issue. There are however two types of problems with respect to operational issues which arise out of expenditures normally considered as capital.

The first is the problem which results from pressures in the salary sector of the budget. Very often such pressure leads to deterioration of maintenance and repair of physical plant normally provided through the operating budget. The result may be accelerated depreciation or loss of the facility which in turn may lead to a need for replacement at higher cost. One would hope that a funding system would not give rise to any decisions which would involve such a poor trade-off.

The second issue is much more closely related to instruction and may become more critical as the provision for general or vocational education becomes stronger.

When a school which includes laboratories, workshops or commerical facilities is built the initial cost of equipment is considered part of the capital cost. However unlike industry the education system makes no systematic provision for the depreciation of such equipment. It is not unreasonable to expect that some categories of instructional supply such as laboratory supplies, some sports equipment, and library books should be considered as part of the yearly per-pupil expenditure. The depreciation and, increasingly today, the obsolescence of larger items usesd in instruction is not provided for specifically and must also be provided for out of annual per-pupil expenditures. The effect of such policies has been examined by Palmer in the County of Lincoln, (1984) who shows clearly the difficulties created in the area of commerical studies. With government policy supporting the widespread introduction of Computers in Education and the extremely high rate of depreciation and redundancy of much of the hardware currently in use, there is need to recognize these problems which are not normally under the control of a board to a great extent.

3.10 Summary and Conclusions

This section has attempted to examine educational expenditure in

Ontario and the factors which may be associated with their increase.

The following summary reflects the major points made and the conclusions arising from the discussion.

1. Ontario is currently providing the third highest level of per-pupil expenditures of the ten provinces of Canada. It ranks ninth out of the ten provinces in terms of the proportion of total personal income devoted to education and seventh out of ten in terms of the proportion of gross domestic product allocated.

2. While actual per-pupil expenditures in Ontario increased in the period 1971 to 1981 by a total of 214.5%, real expenditures (after accounting for inflation) increased by 23.9%.

3. Of the 23.9% increase in real expenditure, 10% has been estimated as the direct result of declines in the pupil-teacher ratio and a further 10-12% has been accounted for by increases in qualifications and experience of teachers.

4. The increases resulting from changes in the qualifications and experience of teachers is in addition to the increase in teachers' salaries resulting from collective negotiations. However in comparison with increases in the labour force as a whole, teachers' salaries, as measured by year to year changes in the salaries of teachers with the same qualifications and experience have not increased disproportionately.

5. Increases in cost resulting from reduced pupil-teacher ratios and increased qualifications and experience may be considered as increases in price or as increases in the quality or quantity of service provided, depending on the assumption of the relationship between the variables and quality. No conclusive evidence for this relationship is available.

6. The current system for determining individual teachers' salaries reflects an assumption of the relationship between qualifications and experience and quality. The grid system reflects an incentive approach the current need for which may be questioned.

7. Although costs associated with the provision of increments for experience may be projected, those which are associated with additional qualifications cannot since they are automatic and achieved as the result of employee rather than employer decisions. The system of salary determination, the Burham scale used in England was provided for contrast.

8. The discussion of economies of scale suggested that whilst some economies of scale are possible in education, the evidence for this existence especially when associated with measures other than cost is slim. There is evidence of diseconomies of scale especially when associated with measures of program quality.

9. As schools or school systems increase in size the marginal cost in terms of expenditure for a school system does not increase as much as the increase in grant revenue in a system which provides per-pupil grants. In a system with declining enrolments the actual saving to a board is not as great as the decline in revenue received in a per-pupil grant system. This creates difficulties for all boards except those in a steady enrolment state.

10. There is a need for continuing program cost analysis at the school system level. Absence of such data tends to force decision-makers to look only at the provincial averages thus risking the attainment of vertical equity.

11. Throughout the section the influence of changing government policies on cost has been referred to. It is argued that these policies have contributed substantially to the increased per-pupil expenditures over the period. Whilst the appropriateness of these policies has not been questioned in this paper, it has been argued forcefully that the implementation of change has seldom been accompanied by estimates of associated costs at a sophisticated level.

12. In comparison with other provinces in Canada, Ontario has been relatively successful in controlling increase in cost per-pupil. Between 1975 and 1981 the rate of increase in Ontario was lower than that of seven other provinces.

13. Some mechanisms which might prove helpful in controlling costs were examined but it was noted that the Canadian evidence of the role of strict provincial control over budget preparation was slender. Two provinces which showed the highest and third highest rates of expenditure increase in the period 1975-1981 were also provinces with a high degree of central control over the budgetary process. No attempt was made to discuss any reasons for the rapid increase.

14. No attempt was made to analyse capital cost. However it was noted that problems occur when practice involves operating and capital cost. Two examples were provided. The first was when pressure on operating budget results in deemphasis on maintenance programs with accelerated depreciation of physical plant. The second was the need to replace out of operating expenditure expensive instructional equipment originally included as capital equipment.

15. Throughout this part of the paper reference has been made for the need to develop a more extensive analytic system which could provide continuing and objective data on questions of educational finance.

REFERENCES FOR SECTION 3

Anderson, Barry, "The Costs of Controlling the Costs of Education" in The Costs of Controlling the Costs of Education in Canada, Proceedings of a Symposium on Education Finance AERA 1983.

Atherton, Peter J., "Collective Bargaining: Its Impact on Education Costs", Paper presented at the Annual Meeting of the American Educational Research Association, Montreal, Quebec, April 12-15, 1983. (Accessible through ERIC ED231040).

Brown, Wilfred, "The Educational Toll of the Great Recession", in The Costs of Controlling the Costs of Education in Canada, Proceedings of a Symposium on Education Finance AERA 1983.

Brown, Wilfred, Education Finance in Canada, Ottawa: C.T.F. 1981.

Coleman, Peter and Linda La Roque, "Economies of Scale Revisited School District Operating Costs in British Columbia 1972:82, Journal of Education Finance, 10:1 Summer 1984.

Dawson, D.A., Economies of Scale and Cost Quality Relationships in Elementary and Secondary Education: A Survey, Toronto: C.O.D.E. 1978.

Knezewitch, Stephen J. and John Fowlkes, "Salary Schedules", in Perspectives in the Economics of Education, Ed. Charles S. Benson, Boston: Houghton Mifflin Company, 1963.

Ontario Ministry of Education, Education Statistics Ontario, 1981.

Ontario Ministry of Education, Education Statistics 1982, Toronto, 1982.

Palmer, Edward, "Cost Analysis of Secondary School Supply Expenditures to Generate a Cost Per Pupil-Per Credit Course, with a Complementary Education Supplies Cost Index", Unpublished M.Ed. Thesis, College of Education, Brock University, 1984.

Stager, David, Elementary and Secondary School Teachers' Salaries in Ontario, 1900 to 1975, Toronto: C.O.D.E. 1978.

Statistics Canada, Financial Statistics of Education, Ottawa, 1984, Cat. #81-208.

4.0 CRITICAL ISSUE: How Shall We Raise the Money?

The financing of education has in the past been treated as a unique problem. In the 1960's there began a trend to treat the funding of education as one aspect of a more general problem of funding the public sector as a whole. As social priorities shift from the young to the old, and demand for other social services grows the competitive position of education for a share of public resources weakens. In this context one may question whether the revenue problem in education occurs as a result of a shift in priorities or whether it occurs as the result of a system of revenue raising which itself has negative appeal. To a large extent selection of the first alternative will make apparent any weakness in the system of revenue. It is also possible to pose the question in another way by questioning whether the problem is one related to the total resources available or whether it is related to the distribution of the burden.

The following sections will attempt to examine both questions.

4.1 Current Distribution of Revenues for Education in Canada and the Provinces

It is acknowledged that the federal government make both direct and indirect contribution to elementary and secondary education in Ontario. The direct contribution to school board revenues amounted in 1981-1982 to just over \$19 million or less than ½ of 1 percent. (Statistics Canada, 1984).

The indirect contribution in 1981-1982 in the form of shared cost programs, principally on the second language area, was somewhat greater at \$31.2 million. (Statistics Canada, 1984). Since the federal contribution is made to the provincial government, it is included as a provincial contribution to school board revenue. It is argued that this inclusion will not distort the general discussion. The discussion is therefore limited to provincial and local sources of revenue.

Since the only significant base of local tax for education is the property tax, the terms property tax and local taxation are used interchangeably except where specified.

In 1960-1961 local taxation in Ontario accounted for 55.42% of total spending for elementary and secondary education. By 1977 the local share had decline to 45.1%. By 1983 the proportion had increased to 51.8%. (Education Statistics Ontario, 1984, p. 163). The reversal of the trend of the 1970's is perhaps as significant as the level itself.

For comparative purposes the percentage distribution of sources of school board revenue are provided in Table 4.1 below. The differences in amounts from those used above result from differential methods of defining and counting amounts in sources.

TABLE 4.1

Percentage of School Board Revenues
Canada and the Provinces 1981 from Local Taxation

Province	% Local Taxation	Rank
Newfoundland	2	8
Prince Edward Island	0	9
Nova Scotia	20	6
New Brunswick	0	9
Quebec	4	7
Ontario	46	2
Manitoba	46	2
Saskatchewan	43	4
Alberta	37	5
British Columbia	47	1

Source: Computed from Statistics Canada (1984) p. 46.

At first sight it would appear that Ontario is in the forefront of these provinces which place heavy reliance on the use of property tax to support education. For this reason it is important to note that the data is somewhat distorted by definitional problems. Both Prince Edward Island

and New Brunswick continue to use the property tax in the form of a provincial tax. The provincial governments in Alberta and British Columbia levy taxation on non residential property. Clearly the straightforward breakdown of sources of school board revenue in the fashion presented in Table 4.1 is of limited use for comparative purposes even though the approach is popular.

Perhaps a better approach to the problem is that provided by the following table compiled by Prof. H. Kitchen of the Department of Economics, Trent University.

This table provides details of the per capita property taxes, whether provincially or locally levied.

TABLE 4.2

Per Capita Property and Related Taxes (Including Business Tax)
By Province for 1981

Province	Residential	Non-Residential	Total
	$	$	$
Newfoundland	36	65	101
Prince Edward Island	84	84	168
Nova Scotia	118	144	262
New Brunswick	157	62	219
Quebec	168	184	352
Ontario	261	269	530
Manitoba	239	253	492
Saskatchewan	194	269	463
Alberta	231	304	535
British Columbia	306	295	601
Canada	222	234	456

Source: Catalogue no. 68-202; for 1981, Provincial Government Finance (Revenue and Expenditure), Estimates, annual
Catalogue no. 68-205, and Local Government Finance (Preliminary) 1981 and (Estimates) 1982, annual
Catalogue no. 68-203. Population figures were obtained from the Department of Finance, Economic Review, Ottawa, April 1983, Table 2, p. 120.

It should be noted initially that the table does not specify the purpose for which the property tax is raised and therefore cannot be considered as reflecting the role of the property tax for educational purposes. Nevertheless it is clear that the property tax burden for whatever purpose it is used, is in Ontario the third highest in Canada overall. The residential taxpayer in Ontario carried in 1981 the second highest per-capita burden in Canada. Non-residential property taxes in Ontario bore the third highest burden in Canada.

The heavy reliance upon local revenue for education in Ontario noted in Table 4.1 together with the above average burden of the property tax as a whole shown in Table 4.2 makes it possible to argue that Ontario places one of the heaviest burdens in Canada upon the property tax as a source of revenue for education. This finding tends to support the position which sees the distribution of the burden of providing revenue for education as important as the size of the burden itself.

4.2 Educational Revenues in England

It has been noted elsewhere that in England the existence of all-purpose local authority makes comparisons with the single purpose Canadian school board difficult. Revenues for local government authority expenditures (including education) are derived from two sources. The Rate Support Grant provided by the national government and the proceeds of a local tax on property calculated on the rental value of the property.

Although in recent years the proportion of revenue provided by the Rate Support Grant has averaged in excess of 60% for recent years Swanson

(1982) noted that for 1981-1982 it was set at 59%. While the decline in senior government support of municipal expenditures has not been as marked in England as it has in Canada and in Ontario in particular, the overall increases in Canada and in Ontario in particular have resulted in substantial increases in the 'rate' or local tax levels. Between 1978-1979 and 1983-1984 the average rate levied increased some 64 p. in the pound to just over 139 p. in the pound, an increase of approximately 117%.

There is clear evidence that concerns exist similar to those which are being voiced in Canada insofar as the role of the property tax is concerned. These issues will be dealt with under the appropriate heading.

4.3 Educational Revenues in the United States

Table 4.31 provides a breakdown of revenue receipts of school boards in the U.S.A. Perhaps the caution provided elsewhere with respect to the use of aggregate data is even more appropriate at this point. The U.S. provides a wide variety of systems of school financing and thus the use of aggregate data in Table 4.31 is undoubtedly distorted by the data from states which provided a high degree of financial support and those which provide very little. For instance in 1979-1980 the proportion of local revenues from state resources ranged from 23.2% in South Dakota to 80.9% in New Mexico. Eleven of the forty-nine states supplied more than 60% or more of revenue. and a further twelve between 50% and 60%.

TABLE 4.31

Revenue Receipts of Public Elementary and Secondary Schools
by Source, 1958-1980

School Year Ending	Percentage Distribution			
	Total	Federal	State	Local
1958	100.0	4.0	39.4	56.6
1962	100.0	4.3	38.7	56.9
1966	100.0	7.9	39.1	53.0
1970	100.0	8.0	39.9	52.1
1974	100.0	8.5	41.7	49.8
1978	100.0	9.8	45.7	44.5
1980	100.0	9.8	46.8	43.4

Source: National Center for Education Statistics, Digest of Education Statistics, 1977-1978, 1981, 1982. Washington, D.C.: U.S. Government Printing Office.

In commenting on the shifts evident in the table Mueller and Webb (1984) state

> In terms of fiscal responsibility for the public schools, states have increasingly assumed more of the costs since the early 1970's. By 1980, state sources contributed almost half of all public school revenues. State-collected taxes on wealth, income, and consumption will provide the primary service of school support in the future. The shift away from locally collected revenues will mean a reduced reliance on the property tax for the support of the public schools, and will thus bring more equity to the tax structure supporting education. At the same time, the broadening of the base of allocation brought about by the increased reliance on state revenues should bring more equity to the allocation dimension.
>
> Mueller and Webb (1984) p. 14

For the purpose of this discussion it is worth noting that Ontario relies more heavily (46%) although only marginally so on local revenue to support public education, than is average practice in the U.S.A.

If it be argued that state support is lower than provincial support (64% in Ontario) it must be remembered that many programmatic initiatives supported by federal aid in the United States are, in Canada, provincial initiative.

Federal monies are granted for very specific purposes and, by virtue of the constitution, made available to all states and jurisdictions which can meet the detailed requirements of the various programs. Among the initiatives which receive support under the federal categorical aid, are special education classrooms, inner city school programs, first time library resource-center construction grants and more recently grants for special projects in the use of computers in curriculum in mathematics and sciences. Federal grants have also been made available to stimulate the implementation of Supreme Court decisions affecting civil rights. Grants to support transportation costs in support of school integration provide examples of this type of aid. In the U.S. system federal aid is normally payable directly to school boards upon approval of applications which are considered by the federal government agency concerned. They are received in addition to any monies paid under the various state formulae (provided that the program does not violate state law).

Although there is no indication that the Canadian federal government is interested in providing more resources for public schooling, it is worth noting a comment in the fifth annual yearbook of the American Educational Finance Association.

> The trend to reduce federal aid to education that began in the early 1980's is projected to continue into the second half of the decade, if not for philosophical reasons, then because of the already large federal deficits. The diminished involvement of the federal government will place increased demands on state and local taxes for school support. Consequently, it will understandably be state and local governmental tax policies, in at least the near future, that will determine the fiscal support for innovation and school reform.
>
> Mueller and Webb (1984) p. 18

Whilst the significance of this conclusion must be viewed in the context of the substantial number of states which have included state constitutional limits to the role of the property tax, the message which comes from an examination of school revenues in Canada and the U.S. is that, for different reasons, there is a trend towards making central governments increasingly responsible for the provision of educational resources.

4.4 Problems of Revenue Raising in Ontario

The discussion thus far permits the identification of one major problem of revenue raising in Ontario. That problem is a heavier reliance on the role of the property tax in providing educational revenue in Ontario than in most of the other provinces in Canada, the United States, and in England. Such heavy reliance would not be necessarily bad if the property tax were generally agreed to be a 'good' tax and if it were well administered.

Should the property tax fail to meet these criteria however, the case can be made that heavy reliance will tend to compound the fundamental problems associated with its use.

4.41 The Property Tax

The literature of public finance which deals with the property tax is vast. It is not proposed therefore to deal with the fundamental issues pro and con the property tax in this paper for three major reasons.

1) The elimination of the property tax in support of education would place such an immerse burden on other tax-bases as to distort the entire system of taxation and require a complete overhaul. This may be justifiable but hardly practical.
2) All jurisdictions studied with the possible exception of Newfoundland where the system does not widely exist, access the property tax base to some extent.
3) While public and some special interest groups urge the removal of the tax, there is no empirical indication of a "taxpayer revolt" as might be evidenced by refusal to pay taxes or even withold significant portions of them.

There is a fourth reason why some would argue for the continuance of the local property tax for education revenue. The reason however, is neither as pragmatic or certain as the first three.

It is considered axiomatic in the U.S. literature that maintenance of local control or responsibility is an essential element of democracy. Furthermore this maintenance is strongly related to the degree of fiscal responsibility assumed by the locality. Since by and large the only source of local revenue available to local school boards has been the property tax, the access to and continuation of the property tax was seen as the only way of guaranteeing local control. Given the responsibilites of U.S. boards discussed previously, and the attitude to innovation requiring "lighthouse" school districts this may have made sense.

While the same arguments with respect to the need for access to the property tax as a means of providing for local control have been made in Canada it is clear that, in some provinces at least, the argument has been denied. In Ontario the arguments supporting the relationship between local control and access to local resources are still strongly voiced.

In 1975 the Paris based Organization for Economic Cooperation and Development undertook a review of education policies in Canada. Its report published in 1976 was by no means as complimentary as many officials and organizations could have hoped. The finding of the observers with respect to local autonomy are worth quoting at some length.

Quite early in the section dealing with "Democratization and Participation" they state

> Conventionally in Canada, it has been assumed that demands for democratic participation in education would be, and are, met by the deep-rooted tradition of decentralization of school control and administration. Yet, demands for democratisation and participation are manifestly in the air in Canada, apparently unsatisfied by the conventional approach via decentralization.

Organization for Economic Cooperation and Development (1976) p. 65

After reviewing the system of provincial instruments for control over local boards the examiners observed:

> It follows from all the above that provincial governments have at their disposal a wide variety of policy instruments, capable of shaping policies not only at the school board level, but even within the individual school and classroom. It is also evident that provincial administration does not hesitate to use such instruments when the need is felt. Local weaknesses are therefore rarely to be attributed to observance of some general principle of provincial respect for local autonomy, but either to a lack of concern for such weaknesses or, in some cases, to political weakness preventing the use of available instruments to achieve unpopular ends.

p. 65

At the end of the section the following conclusion is reached

> This obvious discrepancy between Ministry lip-service to decentralisation and a reality that is moving continuously in the direction of less decentralization, lends the entire discussion about local participation a somewhat insincere tone and, perhaps more importantly pushes it in the wrong direction. The question is not whether more or less decentralization means more or less democratization, but how can it be arranged that open decision-making and execution of affairs in the educational realm be brought about in a democratic manner?
>
> p. 70

The above comments provide grounds for doubt about the existence of real control of schools by school boards. It is possible to add a further concern to the debate. Given the extent to which the centralization of school board administration has taken place one can question whether the size of jurisdictions make any real degree of local participation or control possible.

Whilst it may be argued that local control in very large units of municipal government exists in England it must also be remembered that for each school the L.E.A. controls, there is a management committee which assures some degree of local involvement without the responsibility for revenue raising. It is also worth noting in Quebec that proposals last year to increase the degree of local participation and control over schools, part of a school reorganization bill withdrawn before debate, include the setting-up of local school committees.

There is considerable doubt about the validity of the traditional assumption that access to the property tax is a prerequisite for local and democratic schools in Ontario.

Nevertheless it is argued that continuation of the property tax in one form or another will be read in the foreseeable future. As a result one must focus on some of the difficulties associated with the administration of the tax.

4.42 Administration of the Property Tax

While much attention is focussed on the system of grants in exploring questions of equity, it must be remembered that these questions must also be explored in connection with revenues. In the context of the current program of financing education in Ontario this means an examination of the property tax.

In 1969 the provincial government decided:

> Property taxation in Ontario stands in need of fundamental reform, perhaps more so than any other area. As the Smith Committee and the Select Committee so clearly showed, the present property tax is grossly unfair and inefficient.
>
> Ontario Budget (1969) p. 63

After identifying a number of thrusts in the provinces plan for reform, the government noted:

> Of these, reform of assessment is the most crucial for it is the foundation upon which subsequent reforms in these other areas must be based.
>
> Ibid (p. 63)

Nearly ten years later Bird and Slack (1978), in a paper prepared for the Commission on Declining Enrolments, document some of the difficulties experienced in the attempt to implement reform. For instance, they note in connection with market-value assessment, "The resulting increases in tax rates in some areas would be so politically unpalatable that steps would have to be taken to alleviate them ..." (p. 21). They also note "... the widespread acceptance, for whatever reason, of the idea that residential property, should be favourbly treated under the property tax." (p. 30) This acceptance, they add, creates problems in the equitable treatment of non-residential property. They state that in 1977 the effective rate on residential property was only 1.5 percent compared to the 2.8 percent levied on non-residential property (p. 32). These difficulties and others mitigate against thorough going reform of the property tax in Ontario. Rideout (1978), having discussed the reasons associated with the postponement of plans for property tax reform in 1978 comments,

> The inherent equity in the Ontario school grants plan is predicated on the existence of a standard measure of tax-paying ability. With the shelving of tax reform it will be incumbent on the province to devise more up-to-date assessment equalizing factors than those in existence in 1970 if the equity in the grant plan is not to be compromised.

This paper would add one more voice of support for reform.

The Commission made two recommendations with respect to the use of the local property tax. They were:

Recommendation 100. All industrial and commercial properties be assessed and taxed for school purposes directly by the province, and be excempted from school-related municipal taxation; there be one school-related industrial-commercial rate for the province, the proceeds of this tax be applied solely to the support of elementary (separate and public) and secondary education in the province as part of the equalization formula applicable to general legislative grants.

Recommendation 101. The taxation of real estate for education purposes be the source of 40% of the total provincial costs of board operations within the ceiling of expenditures recognized for grant purposes. (If the first of these two major recommendations is accepted, there will be two components to the taxation of real estate: one will be the provincial tax on industrial-commercial properties for school purposes, the other will be the local taxes on residential and farm properties for school purposes. It is the sum of both of these that is to be 40% of the costs of board operations.)

It is clear that the Commission did not make a firm commitment to the 40% local contribution since the discussion in the Report (p. 298) talks of "... a target of 40% (or some approximation thereof) ...". It is therefore debatable whether or not the current 46% is meeting the stated objective.

What is clear however is that there has been no movement towards the provincialization of non residential property tax. It is argued that this recommendation is particularly critical now that it proposed to include the separate high schools into the overall school revenue base. Without commenting on the equity aspect of the issue which could become the subject of challenge by Separate School Boards under Section 15 of the Constitutional Act, there is another issue.

Adjacent Public and Separate elementary Boards in Ontario traditionally attempted to keep mill rates roughly equal. This attempt has been made easier by the current grant structure which provides equalization for expenditures up to the ceiling level thus making less significant substantial differences in assessment. Only when boards separate or public spent beyond the ceiling level did the differential assessment become a significant problem. In fact, until relatively recently all elementary boards have tended to stay at, or just above, ceilings. The picture with respect to public high schools is different. Almost all high school boards have been above ceilings for ten years or more. If there is an attempt to match public high school offerings, separate high schools would also tend to exceed ceilings. It must be emphasized that provincial grants in 1983 supported only 41.98% of the total secondary expenditures. (Education Statistics Ontario, 1983, p. 163). In this event the substantial difference in property tax bases will become of administrative and political significance. The proposal to provincialize industrial and commerical assessment therefore becomes of much greater importance. The significance of the issue might be offset by a substantial increase in the ceiling thus providing greater horizontal equity. It could also be offset by provisions similar to those used in Alberta whereby there is equalization of the supplementary requisition to go beyond the ceilings set by the foundation plan.

There are two further aspects of the role of the property tax which are worthy of consideration.

The first involves consideration of the private and social benefit issue. It is an implicit assumption that the public financing of all educational services is justified on the grounds of general social benefit. There was a time when the curriculum was so restricted in terms of a program of basic skills that the social benefit argument was not difficult to justify. The expansion of the curriculum to cover almost all aspects of academic, social and cultural life raises questions in the mind of many as to whether there is a need to distinguish between social and private benefit and therefore to distinguish between social and private cost. At the moment this distinction may take place at the school board level. For instance some boards treat driver education as a private cost and charge fees. Others include driver education as part of the program and fund it out of general revenue. There are some other programs in schools which it is difficult to justify as a purely public benefit, and for which students should be responsible. Decisions of this nature would not necessarily influence total cost but could have the effect of redistributing some of the problems of revenue raising to those who derive substantial private benefits. This discussion will be dealt with further in the section on distribution.

A second major approach to the revenue question is to be found in the relative shares of the property tax which support education and general municipal services. It has long been a claim of non-school municipal authorities that their ability to provide municipal services as a service to property owners is inhibited by the high level of property taxes required by school boards. This argument is based on the so-called benefit principle of taxation. Whilst this argument may well be a disguised plea for increased municipal grants it might well be possible to increase general grants for education by limiting municipal grants particularly for those functions which provide direct services to property owners.

The argument by childless property owners that it is inequitable that the property tax be used to support a service which is unrelated to the benefits of property ownership, while difficult to substantiate in a general consideration of taxation issues, does have an appealing logic for those concerned with municipal administration. A redistribution of provincial funds in the manner proposed might well reduce any face validity of such an argument.

There are two final points to be made in connection with the administration of the property tax and its use as a source of educational revenue.

The first concerns the regressivity of the property tax. There is no doubt that the property tax is regressive in effect since it constitutes a heavier burden on those for whom expenditures or accommodation are a relatively high proportion of total expenditure. This is also a characteristic of the general sales tax. While to some extent the regressivity of the property tax is in Ontario offset by the provision of tax credits it may be argued that the regressivity or progressivity of any individual tax should be viewed in the context of the overall tax burden. While the property tax does serve to diminish the overall progressivity of the total tax burden it does not eliminiate it. It is important to note that an increasingly heavy emphasis on the property tax base will inevitably result in a further decrease in the progressivity of the tax structure with adverse effects on general equity.

A second point must be made with respect to the elasticity of the property tax base.

As has been shown earlier most of the increase in expenditure on education in Ontario has been the result of price level increases. Since price levels for educational services have not increased by marked different rates from those measured by the Canadian Consumer Price Index (Lawton 1983, p. 35) a case can be made for supporting educational expenditure through a tax base which is responsive to increases in price levels. Income and sales taxes are agreed generally to be more responsive to increases in prices in the economy as a whole than is the property tax. One consequence of heavy reliance on the property tax is the high degree of visibility of annual rate increases to meet 'normal' price level increases. This is particularly true in jurisdictions where the assessment base is relatively stable as a result of a lack of economic growth or weakness in assessment updating procedures.

4.5 Conclusions and Summary

This section has suggested that the current heavy reliance on the property tax as a source of revenue for school boards compounds the problem of financing education. A number of suggestions have been provided for redistribution of the burden which do not necessarily involve substantial increases in the quantity of provincial revenues devoted to education. However it is recognized that some increases will be necessary if overburden of the property tax is to be avoided. It is suggested that a combination of approaches could, in a relatively brief period, bring the relative shares to the level of 60% provincial support, 40% local support proposed by Jackson.

The following summary reflects the major points made and the conclusion arising from the discussion.

1. It is difficult to determine whether the problems of revenue raising for educational purposes are a function of the size of the burden itself or a function of the manner in which the burden is distributed.
2. Ontario ranks second with Manitoba in the proportion of local financing of school board revenues in 1981 with a proportion of 46%. British Columbia has the highest proportion.
3. This rank ordering may not present an accurate picture of the burden of local taxation for education because many provinces define the property tax as a provincial rather than a local tax base.
4. Ontario ranked second to British Columbia in terms of the total per capita residential property tax burden in 1981.

5. Ontario ranked third after British Columbia and Alberta in terms of the total non residential property tax burden in 1981.

6. Ontario ranked third after British Columbia and Alberta in terms of the total residential and non residential property tax burden in 1981.

7. In England the property tax in 1981-1982 supported 40% of total municipal expenditures.

8. In 1980 the local taxes supported 43.4% of school board revenues in the United States.

9. Within the limitations provided by the discussion Ontario relies more heavily on the property tax to provide educational revenues than do most Canadian Provinces, the United States and England.

10. It is considered that there will be continued reliance on the property tax as a provincial or local source of revenue for education.

11. The need for local access to the property tax in the name of local control is questionable.

12. The recommendation of the Commission on Declining Enrolments with respect to the provincialization of the non residential property tax is supported.

13. The recommendation is seen as increasingly critical in terms of the proposal to provide funding for separate high schools.

14. It is argued that some programmatic activities of the schools constitute a private rather than a social benefit thereby lessening the case for public support of the entire curricular offering.

15. The reduction of municipal grants and a corresponding increase in the provincial share of school board revenue is suggested as a means of responding to the benefit based argument that property taxes should be used to support services to property.

16. It is argued that the regressivity of the property tax in Ontario is offset by the current tax current system and that the regressivity argument must be considered in the light of the progressivity of the total tax-burden.

17. One of the major problems associated with the continuing heavy reliance on the property tax as a school revenue source is its relatively inelasticity which renders highly visible rate increases necessary to meet normal price level increases. This is particularly true in times of a relatively stable assessment base.

18. The proposal of the Jackson Commission to reduce the locally levied tax in support of education to 40% is endorsed.

REFERENCES FOR SECTION 4

Bind, R.M. and N.E. Slack, Property Tax Reform and Educational Finance, in Ontario, Toronto: C.O.D.E. 1978.

Brown, Wilfred, Education Finance in Canada, Ottawa: C.T.F. 1981.

Budget Ontario 1969, Ontario Department of Treasury and Economics, Toronto, 1969.

Government of Ontario, Education Statistics Ontario 1983, Toronto: Ministry of Education, 1984.

Lawton, S., "Ontario's Approach: Paying School Boards to Save", in The Costs of Controlling the Costs of Education in Canada, Proceedings of a Symposium on Educational Finance, A.E.R.A., 1983.

Mueller, Van D. and L. Dean Webb, "Public School Business Management: Context and Future Directions", in Managing Limited Resources: New Demands on Public School Management, Fifth Annual Yearbook of the American Education Finance Association, Cambridge: Harper & Row, 1984.

O.E.C.D., Reviews of National Policies for Education: Canada, Paris: O.E.C.D. 1976.

Statistics Canada, Financial Statistics of Education, Ottawa, 1984, Cat. #81-208.

Swanson, Austin D., "Centralized Finance and Decentralized Control in England: Implications for the United States", Journal of Education Finance, 7:3 Winter 1982.

5.0 CRITICAL ISSUE: How Shall We Distribute the Resources?

There is no shortage of literature dealing with the technicalities of varying systems of resource distribution. What is perhaps most important about the grants systems which have been adopted or dropped over time is that they were designed to meet problems of a general or specific nature for the jurisdiction involved. Thus the earliest system of grants in the early 20th century recognized the need to stimulate localities to provide educational services through the provision of monies to offset the costs of hiring teachers or building schools. Little attention was devoted to the form as distinct from the amount of the aid.

The history of the development of grant systems since the 1930's has been increasingly dominated by concerns over the form of aid as well as the amount. During the period following the great depression there was a growing concern with social equity and a decline in the productivity of the property tax. Agricultural and industrial failure made obvious the wide discrepancies in ability to provide basic education. From this time attention tended to focus as much or more on the form than the amount since the amount was limited anyway by the general shortage of resources.

The major contribution of this period was the development of the so-called "Foundation Plan." This term originated in the United States in the 1920's and was described as a plan which sought the twin goals of "equalization of educational opportunity" and "equalization of school support." Strayer and Haig (1923) identified the two major conditions which would need to be met to attain these goals. They were

> ...(1) to establish schools or make other arrangements sufficient to furnish the children in every locality within the state with equal educational opportunities up to some prescribed minimum; (2) to raise the funds necessary for this purpose by local or state taxation adjusted in such manner as to bear upon the people in all localities at the same rate in relation to their taxpaying ability.
>
> Strayer and Haig (1923) p. 1974-1975

It should be noted that the original definition was made in terms of a "minimum" program. In most of the literature associated with foundation programs there is implicit acceptance of the right of local jurisdictions to go beyond the minimum level. Indeed as has been noted above the provision of taxable capacity was considered essential for the development of "lighthouse districts" and the maintenance of local autonomy in educational matters.

The aim of the early designers of foundation plans was to provide a measure of horizontal equity. This concern is still evident. To this concern however has been added that of the provision of vertical equity. There is no need to change the term "equal educational opportunities" or "some prescribed minimum" in the original conditions for establishing a foundation program. There is a need however to change the definition of these terms as changing societal values dictate.

To a large extent all provinces in Canada attempt to achieve the conditions necessary for the implementation of a foundation program albeit through a variety of mechanisms.

5.1 Resource Allocation Systems in Canada

In order to simplify discussion of Canadian resource allocation systems an attempt has been made to place each of the ten systems into one of three types. Each type reflects primarily the degree of centralization of allocations and budgetary process. The voucher system, an extreme form of decentralization is discussed separately.

Since specific details of financial plans are in a state of year to year change no attempt has been made to provide detailed discussion of any provincial system other than that of Ontario. To a large extent the information provided below is based upon a major study prepared for the Council of Ministers of Education, Canada in 1983. It is supplemented by information derived from Brown (1981) in his Education Finance in Canada.

5.11 Highly Centralized Systems

Three provinces have highly centralized systems. They are New Brunswick, Prince Edward Island and Quebec.

It may be argued that the dependence of all three provinces on federal unconditional transfers for such high proportions of provincial revenue to some extent forces the adoption of a highly centralized system of distribution if for no other reason than accountability. This argument does neglect the concern evident in the literature for the achievement of a high degree of equality of educational opportunity as a means of achieving broader social and cultural goals.

New Brunswick and Prince Edward Island both provide 100% of school board revenues. In Quebec school board revenue is provided partly through a locally collected but provincially mandated 'normalized' property tax and a grant from the provincial government. The placement of the three systems into the highly centralized category is based on the degree of centralization of the budgetary process and the opportunity of the board to access local resources at its own discretion. In all three provinces the access to local resources is limited or non-existent. In New Brunwick it is non-existent. In Prince Edward Island extra funding for programs supplementary to those provided for in the budgetary system can be raised through local taxation only with the authorization of the Minister of Education. In Quebec, boards of education are limited to imposing local property tax for non-subsidized expenditures of a maximum of 6% of the operating budget. Additional access to local taxation requires a local plebicite.

In all three provinces the school board budget is complied in accordance with strict rules and requires central approval. In all three provinces the formulae which govern budget formulation make it possible to take into account differences in need. In Quebec the level of grant is calculated for each school board individually by the application of parameters developed from a uniform method and covers all operating costs. In New Brunswick allocation formulae are moderated by parameters which take into account the size of the district, socio-economic conditions and other factors.

The centralization of resource allocation and budgetary control in these provinces has created the potential for the achievement of both horizontal and vertical equity through variations in formula parameters. The centralization of the revenue system also tends to meet the needs of vertical equity.

It is worth noting that the provision of equity in these systems is made possible through two developments. The first of these is the introduction of provincial salary negotiations and the creation of sophisticated management information systems and the centralization of much of the accounting necessary. It could be argued that in fact these two developments are requirements for the institution of a highly centralized funding system. The centralization of salary negotiations is a necessary part of the financial accountability to the legislative branch. The centralization of accounting systems is essential for the same reason.

As has been suggested above the highly centralized systems have not been very successful in controlling educational expenditures. Between 1975 and 1981 Quebec recorded the highest rate of increase in per-pupil expenditure in Canada and New Brunswick the third highest (p. 71). The reasons for these rates of increase are complex and must be accounted for in part by the commitment to equality of educational opportunity. What is clear however is that centralization of resource allocation and budgetary is _per se_ no guarantee of cost control. Furthermore as an analysis of expenditure in Quebec and New Brunswick by Michaud (1983) shows, the centralization of salary negotiations and salary scales provides no guarantee of strict control over salaries and conditions of employment without direct legislative intervention.

5.12 _Partly Centralized Systems_

The two provinces which may be included in this type are Newfoundland and British Columbia.

Whilst Newfoundland exercises little direct control over the budgetary process it does provide for provincial support for the budget. The province supports 100% of teachers' salaries which are paid according to a provincially set salary scale, 90% of pupil transportation, 50% of the cost of high school textbooks and 100% of the costs of textbooks for kindergarten to grade 8. In addition the government provides a basic per-pupil grant plus a number of other special grants. As a result the province provides close to 95% of total expenditures through government grants.

The inclusion of British Columbia as a system with a partial degree of centralization is arguable in view of the degree of legislative authority which the current government has enacted. It is justified in this instance on the grounds that governmental intervention over the course of the last two or three years has been aimed directly at controlling the total costs of the educational system and the distribution of the property tax burden. It has done this by removing the non-residential property tax from the control of local school boards, by instituting controls over teachers' salaries and their conditions of employment. In addition it has introduced a system of budgetary control, which is directed to the establishment of province wide pupil-teacher ratios. There is little indication that the degree of authority assumed by the province was directed towards the achievement of increased degrees of vertical or horizontal equity although the imposition of the mandatory pupil-teacher ratios was aruged to be directed towards attaining a higher degree of equality. However some of the large urban boards, which have mounted a variety of special programs in an effort to meet the needs of disadvantaged children, have been forced to reduce levels of service.

There are indications in the popular press that the severe cutbacks imposed are leading to public demands for reconsideration of the budgetary restrictions. Anderson (1983), who was centrally involved in the introduction of the sytem, after reviewing the situation suggested

> Boards have been very good at keeping the public calm over the situation. They apparently assumed that, in the end, the layoffs and resulting turmoil which would emerge from the initial target budget levels would be unacceptable and that budget levels would be increased.
>
> Anderson (1983) p. 26

It would appear that the situation in British Columbia is beginning to reflect Anderson's observations.

5.13 Decentralized Systems

The systems of Nova Scotia, Ontario, Manitoba, Saskatchewan and Alberta may be described as relatively decentralized in that they tend to reflect the "Foundation Plan" approach.

The foundation plan is defined in terms of a per-pupil expenditure figure which usually reflects the average expenditure of the previous year or years plus some allowance for price level increase. The per-pupil figure, which is intended to cover the main budgetary function, usually incorporates a pupil-teacher ratio which may reflect average practice or provincial policies to increase or decrease existing ratios. The per-pupil expenditure figures are usually differentiated by level and type of school program. Thus secondary school per-pupil expenditure figure tends to be higher than elementary; and vocational technical tend to be higher than general secondary.

Per-pupil expenditure figures also tend to be weighted to reflect differential needs of pupils in the system: Alberta and Saskatechewan for instance provide for separate per-pupil expenditure figures for various categories of special educational needs. In Manitoba and Nova Scotia weighting factors are applied for population sparsity and declining enrolments.

In these systems horizontal equity is provided for through the separation of "need" (as defined by the expenditure figure) and "the ability to pay" (as reflected by the local contribution). Vertical equity is provided by the weighting of the per-pupil figure to reflect differential programmatic needs. One might say that horizontal equity is provided for to the greatest extent by Alberta which pays grants for the foundation or basic level out of a provincial fund into which provincial contributions out of consolidated revenue and proceeds from non residential property taxes are placed. One might also argue that horizontal equity in this system is lessened by the absence of provision for a provincial salary schedule which in turn means that differential amounts of education can be purchased by different jurisdictions for the same dollar because of varying salary levels. Both Nova Scotia and Saskatchewan provide for provincial negotiations which tend to increase the potential for horizontal equity in terms of teaching service provided per dollar.

Another distinguishing feature of the foundation program is its lack of budgetary control. Monies received through foundation plan grants are normally unconditional. There is normally no obligation on the part of a jurisdiction to use monies allowed under the formula for that purpose. This freedom may be justified in terms of local autonomy but has the potential to reduce the degree of horizontal or vertical equity implied through the grant structure.

Yet another characteristic of the systems included in this category is the provision of unregulated access to the local property tax base to support services in addition to the foundation level. In Alberta this access may be limited by decision of the Minister of Education but the effect of this limitation may be considered as reasonable in view of the provisions for equalizing from provincial sources the effect of accessing the local tax base. Manitoba also provides for grants to offset the impact of costs above the foundation level.

It will be noted that one of the major contrasts between the centralized and non centralized systems is in the provisions for access to supplementary revenues beyond the foundation level.

As has already been suggested the literature of school grants emphasizes the need for such access primarily in terms of maintaining local autonomy and providing for "lighthouse districts." It is also possible to justify the need for access to the local tax base for more cynical reasons. Thus if foundation support levels do not accurately refect the real costs of basic programs, and no access is provided for local boards to local revenues, the inadequacies of foundation plans would become very obvious.

One of the political advantages of the foundation plan approach is that provincial governments can justify them in terms of widely acceptable premises i.e. the preservation of local control and the need to recognize local initiative while at the same time avoid the political consequences of underfunding. When the consequence of underfunding i.e. concern over local taxes becomes politically significant, it is possible to shift responsibility to the same jurisdictions by charging local fiscal irresponsibility and local extravagance. This process appears to be most visible in British Columbia at this time.

5.2 Ontario Grant Structure

The Ontario grant structure is typical of the foundation plan approach. The foundation level is recognized through the provision of per-pupil grant ceilings (Recognized Ordinary Expenditures). Expenditures up to the limits provided by the ceilings are equalized by subtracting from the total Recognized Ordinary Expenditures (per-pupil ceilings x enrolments) the proceeds of a provincially mandated mill rate on equalized assessments. The difference between the proceeds of this mill rate and the total Recognized Ordinary Expenditure is provided in the form of a grant. In this way the system attempts to meet the requirements for horizontal equity.

Attempts to provide vertical equity have been introduced into the Ontario structuring through the use of weighting factors. While the use of weighting as a means of attaining vertical equity has been usual practice, specific analysis of the weighting factors used in Ontario has not indicated that they have been directed towards the attainment of vertical equity. The Committee on Costs of Education set up in 1971 devoted a considerable amount of time to the examination of the effects of weighting factors. In Interim Report Number 7 the Committee observed

> In any consideration of weighting factors, it is difficult to escape the conclusion that the criteria for their determination have been developed, at least in part, with the objectives of accommodating the higher spending levels already established by a few boards, rather than to meet the respective educational needs of all boards.
>
> Committee on the Costs of Education (1971) p. 234

The Committee argued that the system of weighting factors should be discontinued. With some modifications they continue to be part of the overall grant structure and thus the basic concern may be considered to still exist. In one respect however the modification of the weighting formula approach has given rise to further concern.

The implementation of Bill 82 and the mandatory increase in provision for special education was accompanied by a transfer of financial provision. The system moved from a weighting factor, based on the recognization of the additional costs of special education to provided at the board initiative to an increase in the general ceiling reflecting the mandatory provision of special education in an integrated approach. There is little indication that the amounts transferred from formula weighting to general support are adequate to cover the additional costs of implementing the mandatory services. Similar concerns might be voiced over the costs of providing compulsory instruction in the second language.

5.3 Critical Problems in the Ontario Grant Structure

To some extent the problems of the current system of school funding in Ontario are common to all foundation programs. They are

5.31) The adequacy of the foundation level of expenditure to provide a foundation level of education.

5.32) The adequacy of year to year adjustments in the foundation level to provide for price and enrolment changes.

5.33) The adequacy of annual adjustments to the foundation level to provide for services which move from the optional to the mandatory.

5.34) The preservation of equity if support levels are inadequate.

5.31 Adequacy of the Foundation or Ceiling Level of Expenditures

It is difficult if not impossible at this time to assess the adequacy of ceilings for two major reasons. First there exists no systematic basis for providing program cost analysis in Ontario schools such as exists in Alberta, Quebec or New Brunswick. There is little evidence indeed that serious attempts have been made to distinguish between basic or supplementary levels of education insofar as programs or achievements are concerned which would need to be a first step in such a direction.

Second the variability of costs which result from the variety of salary schedules, the unanticipated increments resulting from increases in teacher qualification and the differences in pupil-teacher ratio which reflect geographic and demographic factors as well as policy factors compound the problems of assessment noted above.

One way of avoiding the difficulties of determining adequacy is to employ an alternative, but less accurate measurement. For instance, one might suggest that the number of school boards which find it necessary to go above ceilings provides an indication of inadequacy. Generally speaking this argument must be rejected if the position is held that expenditures beyond the ceilings always reflect the local desire to go beyond the minimum. Pèrhaps a more adequate measure would be provided if an attempt was made to provide an external assessment of the quality and nature of the program for those jurisdictions operating at or below ceilings. However it must be pointed out that the weighting factors currently in use have the effect of providing a different ceiling for each board and thus assessments would need to take into account the leeway provided by weightings.

5.32 Adequacy of Year to Year Adjustments

The solution of this problem is perhaps simpler than the first, but the effectiveness of this solution is dependent on the adequacy of the basic level.

Notwithstanding the forgoing the fact is that the provincial contribution to school board expenditures has been steadily declining. This would suggest that the year to year adjustment may not be adequate. The following table shows the proportion of total school board expenditures supported by General Legislative Grants since 1974.

	Elementary	Secondary	Total
1974	61.03	57.17	59.44
1975	62.91	58.94	61.32
1976	58.69	50.58	55.40
1977	58.91	49.14	54.90
1978	57.19	47.69	53.31
1979	56.49	46.72	52.46
1980	55.69	46.75	52.05
1981	55.75	46.18	51.87
1982	54.58	44.32	50.50
1983	53.21	41.98	48.82

Source: Ministry of Education, Education Statistics Ontario 1983, Toronto, 1984, p. 163.

The declining level of support occurred at the same time that in terms of actual dollars there was a steady increase in the amount of provincial support through grants. In 1974 the provincial government granted $1,317,964,000: in 1983 the figure was $2,903,413,000 an overall increase of 120% or close to 12% per year. (Education Statistics Ontario 1983, p. 163).

Some may chose to look at the first set of figures and claim that the province is failing to meet its obligations. Others may look at the overall increase in dollar amounts and say that the province is meeting its obligations but that school boards, through their own extravagance or inability to control costs, are increasing the year to year costs at a rate which outstrips provincial resources.

The problem is that data such as that provided by these two sets of figures is so highly aggregated as to be inadequate for analytic purposes. For instance in the 1974-1983 period legislative grants to separate schools increased from $320,983,000 to $982,846,000 or by slightly over 200%. More detailed examination would show some 41% of the dollar increase in provincial aid was allocated to the separate elementary school system which enrolls some 25% of the student population. Does this mean the separate school system was overcompensated in terms of year to year adjustments?

Part of the explanation is that a substantial increase in separate school enrolment had to be matched by an increase in grants from the province. This is easy to explain and understand. What is less easily understood is that because of the exclusion of the separate school system from the non residential property tax base, the consequent higher degree of financial equalization provided through the grant structure, requires that the provincial government provide a higher proportion of that dollar increase. The same dollar increase for a relatively wealthy board would require a lower proportion of provincial support. In other words year to year enrolment change and price level increases in a relatively poor board tend to be borne by the provincial government whereas in a relatively rich board the same movements would be almost totally borne by the local taxpayer.

Generally speaking this sort of problem is inevitable where the funding system has one basis of decision-making for revenue and another for distribution. In Ontario the amount available for distribution in the form of grants is a function of the overall governmental allocation process. The distribution system tends to be enrolment driven. The critical variable therefore, the amount of expenditure or grant per-pupil tends to be the result of dividing what is available from the cabinet by what is there in the schools. Given the number of factors which influence cost, many of which appear to be outside of the ability of the government to control it is surprising that year to year adjustments do not provide more difficulty. Were it not for the existence of the pressure value of local taxation it is suggested that the inadequacies of the system would be more readily apparent.

Given the predicatly poor prospects for substantially increased allocations to elementary and secondary education for the short and mid-term future perhaps the best that can be done to improve the effectiveness of measures to ensure year to year adequacy in support of the foundation level.

Among such measures are

(a) Regular reassessment of the basic provisions of the grant structure. Obviously a new system every three or four yerars using up-to-date cost data presents fewer problems than a system which remains basically the same for ten years.

(b) Base the foundation program on a more limited view of public interest than the current one thus providing a program which the province can adequately fund.

(c) Adjust the revenue to be received by each jurisdiction by an amount which reflects price level increases in the education sector. Manitoba provides for year to year price increases by multiplying last year's expenditure figure (after adjusting for enrolment change) by the movement of the Canadian Consumer Price Index. One might argue that the Canadian Education Price Index would provide a more suitable base since this might provide a useful source of information for other types of price level adjustment.

(d) Narrow the gap between rich and poor districts. To some extent "rich" and "poor" reflect definitional problems. Thus including non residential assessment in the assessment base of some school districts (public) but not others (separate) artifically created "richer" and "poorer" districts. The provincialization of the non residential property tax would be one way of achieving this.

(e) Introduce an averaging factor which would recognize the marginal cost - marginal revenue problem discussed above (p. 60).

5.33 Adequacy in Relation to Mandated Program Shifts

In the absence of program cost data assessment of adequacy in this respect is made difficult. It may be argued that there is no problem if program shifts are accommodated within the existing resource allocation system at the board level. It may be further argued that many such programmatic shifts are associated with only marginal cost increases which can be accommodated with the general foundation level. The response to both arguments is that the effect of programmatic shifts on cost may be empirically determined and that until the evidence is available the question must remain.

5.34 Preservation of Equity

The above discussion, although brief, has suggested that in the light of current knowledge it may be difficult to judge whether the provision of resources particularly over the longer term is adequate to provide for the degree of equality of educational opportunity deemed appropriate.

In the light of this uncertainty it might be appropriate to discuss the possible alternatives.

The first is to assume that the ceilings provide for a more than adequate basic level. If this be the case then it can be argued that the grant system is inefficient. Moreover it may provide subsidies to boards to provide programs which should reflect only local preferences. The subsidy so created may result in loss of horizontal and vertical equity. Secondly, if the ceilings do not cover the costs of basic levels and require boards to access their own tax base without equalization then there is also loss of horizontal and vertical equity. Only when provincial support provides the exact amount of resources to provide the basic or foundation program and mandatory special programs is there achievement of horizontal and vertical equity.

Since there is little evidence that the third alternative is likely it may be presumed that the Ontario Grant Structure, in providing equalization up to the foundation level only does not provide any firm guarantee of equality of educational opportunity in terms of the achievement of vertical or horizontal equity.

5.4 An Alternative System of Distribution - The Voucher System

The systems of distribution discussed so far all provide government subsidies directly to the institution, the school or the school board. The so-called voucher system would redirect the subsidy to the parent.

The approach is not new and arguments in favour of such a system may be found in the writings of the 18th century economist Adam Smith. Present discussions of the voucher system derives primarily from the work of Milton Friedman (1963). Friedman's proposal entailed giving each parent of a school age child a voucher that could be used to pay for a given level of tuition at any 'approved' school. 'Approved' schools would be those which meet minimum state requirements insofar as curriculum and safety standards are met. The role of the state in educational matters would be limited to providing funds for the vouchers, establishing criteria for redeeming the vouchers, for providing information on schools, adjudicating conflicts and ensuring that all children were enrolled in "approved" schools.

In the late 1960's and early 1970's the U.S. Office of Economic Opportunity (O.E.O.) designed and sought to implement an experiment utilizing the voucher approach. The OEO approach would have provided higher levels of compensation for persons of low socio-economic background and a lottery approach for selecting students in schools where the number of applicants exceeded the number of places available. It proved to be impossible to find a state or school district in which, for legal reasons, the experiment could be fully implemented.

The most recent attempt to implement a voucher system is to be found in the "Initiative for Family Choice in Education" first placed on the ballot in 1980 in California in the form of a state constitutional modification.

The proposal reflects the work of Coons and Sugarman (1978). The following summary of the initiative is derived from Levin (1982):

> Essentially, the "Initiative for Family Choice in Education" would have modified the California Constitution in establishing three classes of schools. Public schools, independent public schools, and family choice (private) schools would be eligible to compete for students. Independent public schools would be those initiated by public educational authorities as nonprofit corporations with their own governance arrangements and would be operated according to the same laws as those affecting family choice schools. Family choice schools would need to meet only standards for private schools at present with no modifications permitted by the legislature. These requirements are rather minimal, so the family choice and independent public schools would have to meet only the most minimal curriculum and personnel requirements. Further, family choice schools would be permitted to teach any social values, philosophy, or religion, with the only qualification being that no pupil shall be compelled to profess a political religious, philosophical, or ideological belief or actively participate in any ceremony symbolic of belief.
>
> The 1979 California Initiative stated that the legislature may take into account a variety of factors when setting the dollar value of educational vouchers, including such factors as grade level, curriculum, bilingualism, special needs and handicaps, variations in local cost, need to encourage racial desegregation, and other factors deemed important by legislature.
>
> According to the language of the initiative, schools would have been permitted to charge higher fees or add-ons to the voucher from wealthier parents without any legislative intervention. Further, there was no prohibition in the California Initiative against "contributions" to the schools that one's children attend or to subsidies from sponsoring churches or other organizations. The result is that richer groups of parents could have augmented vouchers with other resources to obtain far superior education for their children than those parents whose resources and institutional affiliations would limit them to the basic voucher provided by the state.

The initiative itself is provided for reference in Manley-Casimir (1982).

The discussion of the voucher system introduces another dimension to the issues already explored. Thus far the concern has been with the provision of equity both horizontal and vertical. The discussions of the voucher approach introduce concerns associated with economic efficiency. According to West (1982) the public education system is in danger of pricing itself out of the market because of high costs. He divides the high costs of education as resulting from monopoly of two parts: a monopoly bureaucracy, and a unionized labour monopoly. He bases his arguments on the assumption that bureaucrats are prompted "mainly by their own self interest..." and makes two predictions, which he admits are refutable.

> 1. There will be a tendency towards continual expansion of the public education bureaucracies monopoly ("bureaucratic imperialism").
>
> 2. Alliances will emerge between the bureau and the factor supplies (such as labour) it employs. (p. 190)

He sees the voucher system as a potential way of resisting these trends through the partial destruction of the monopoly and the opening up of the school system to competition. Indeed it may be questioned whether the apparently popularity of voucher systems is their potential to provide real parental choice, or to provide a market in which teachers and educational organizations must compete with each other to reduce the rate of cost increase. The Coons-Sugarman proposal is attacked by West on the grounds that it proposes to provide vouchers at 90% of current cost instead of 50% which he maintains is the cost of providing private school education in California (1982, p. 196) suggesting the latter interest.

There is no question that the voucher approach has a superficial attractiveness particularly in the United States where the separation of church and state doctrine has prohibited the provision of public funds to denominational schools per se. No such constitution prohibition exists in Canada. In fact one could argue that the provisions for private schools support in the five provinces of British Columbia, Alberta, Saskatchewan, Manitoba, and Quebec are a form of voucher aid to private schools. Even in Ontario the systems of post-secondary funding education reflects a type of voucher system whereby the per-pupil grant from the provincial government goes with the student, to the institution of his choice. The major difference in the Canadian systems is that the 'voucher' is redeemed by the institution rather than the individual. Nevertheless the system does recognize the crucial issue of the need to provide parental choice especially on denominational grounds. It is also worth noting that the English system provides by law a high degree of parental choice within an overall funding system.

To some extent the voucher proposal reflect a faith in the power of the competitive system to reduce costs. It is argued here that the role of market forces in assuring economic efficiency is limited by the degree to which the market is really "free." It is not necessary to enter into a lengthy discussion of the economic requirements of a perfectly competitive market system to suggest that deregulation of education will not automatically ensure lower costs. The level of educational costs are to a large extent "controlled" by two factors: the average salary of teachers and the pupil-teacher ratio.

Costs can be reduced only when average salaries are reduced and pupil-teacher ratios increased. Both requirements could be met under the current system of funding by legislation or regulation. Teachers' salaries might be controlled by the repeal of the Act which specifically provides the framework. This might result in changing the context of negotiations from the Education Relations Commission to the Department of Labour. It is unlikely that one could remove teachers bargaining rights altogether, even though the current situation in British Columbia suggests otherwise!

Economic efficiency would be increased if the educational system were broken up into small financially competing units. However it is just as likely that the small units would quickly restructure themselves into larger units, reflecting major philosophic, religious or cultural groups. One could also remove requirements for certification insofar as teachers are concerned as a means of reducing the monopoly cost associated with teacher bargaining. However it must be emphasized that these problems reflect the monopoly costs of the organized teaching profession and are not automatically associated with the introduction of the voucher system. Since the voucher system itself has not been implemented in any jurisdiction it is difficult to provide direct evidence on the cost control dimension. Certainly the low costs associated with some private schools in Canada tend to be associated with lower salary levels. However lower levels might be the result of competitive or of lower levels of training in the private school teaching force.

It must also be remembered that a voucher system would entail a very high degree of government intervention of a regulatory type with associated costs.

The above discussion has been couched in terms of economic efficiency and parental choice. Problems associated with horizontal and vertical equity also exist. In the writings of most of the proponents of vouchers the argument is strong on the provision of horizontal equity. The problems of vertical equity are addressed in the Coons-Sugarman proposals but the inherent difficulty of operationalizing concepts of equity still exist.

Certainly providing every student with a voucher equal to the average cost would appear to provide equity but in real terms the problems are the same as those which exist in the foundation program approach. A dollar will not purchase the same amount of education in two jurisdictions. Geographic and demographic problems associated with sparsity, low enrolments and diseconomies of scale will not only continue to exist but may in fact be exacerbated if the number of schools increases as a response to parental choice mechanisms and competition.

The Coons-Sugarman proposal makes reference to the costs of providing transportation. However, as social workers frequently point out, the truly poor have to pay more for their groceries and other supplies because they are limited to using stores within close reach as a consequence of their lack of transportation. Without access to a much improved transportation system to provide mobility, true freedom of choice is effectively limited. Whilst the problems associated with transportation costs are many in the current system of funding, it must be conceded that the administrative problems of making adequate arrangements for the support of private transportation in Ontario would be intense. The problems of providing transportation to achieve parental choice in the English system are decreased by the availability of a highly effective public transportation system. The combination of diseconomies of scale and transportation costs will tend to erode horizontal equity.

A similar set of problems may be associated with the provision of vertical equity. Although the Coons-Sugarman proposals require that special needs and handicaps and variations in local costs be taken into account in setting the value of the voucher, there is little question that putting a dollar figure to these needs would involve as much difficulty as designating adequate provision for public funding systems currently in use.

It is suggested that the achievement of vertical and horizontal equity may be further threatened by the feature common to all voucher systems of the right to 'permit' individuals and groups to supplement the voucher value to achieve the particular kind of education the private choice requires. Even if one accepts the concept of social equity towards which this provision is directed, there arises the question of more general concern associated with the promulgation of views which may not necessarily be directed towards the achievement of cultural harmony. The teaching of racist or extremist political views might be subsidized and the efforts of small but well-funded groups reflecting such views rewarded. The opportunities which currently exist for regulation of such views through school board control would be removed and would be less likely to receive public or legal attention. Again the problem would need to be resolved through regulation and external monitoring.

Finally there is the problem of information. Real consumer choice can only be achieved in the context of a full flow of information. The provision of such information to all parents would require considerable expansion of information systems. Increases might certainly influence the economic efficiency argument. Increased costs would result from the need to establish an appropriate level of "truth in advertising."

While much of the additional cost of providing the required information would become an operating cost of the schools, there would be an increase in current levels of government expenditures if for no other reason than the policing of a "truth in advertising" policy.

All of the arguments between proponents and opponents of the voucher system have to be based on speculation, reasoning or principle since there is no example of the implementation of a complete voucher plan anywhere in the United States. Nevertheless the Coons-Sugarman proposal is conceived of as a solution of the problem of financing education in California. There is a danger in applying the solutions of one jurisdiction to another before examining the problems to which the solutions are directed and the context of their application. There are good reasons for suggesting that California and Ontario are sufficiently different as to warrant concern as to whether the voucher system would in fact be a solution to Ontario difficulties.

For instance the voucher system is directed towards a very highest possible degree of parental choice in educational environments.

Historically Ontario has provided very little choice in the development of education environments, choosing to retain a high degree of central control over curriculum, the interna of education. The emphasis on 'back to the basics' and the development of more stringent curricula (OSIS) does not hold much hope for the development of real alternatives in education.

At least part of the desire for unlimited parental choice in the U.S. and California is the result of the doctrine of separation of church and state which prohibits the use of public monies to support denominational schools. This constitutional prohibition would be removed with the voucher system. In Ontario there is no need to provide a voucher system in order to fund denominational education.

Perhaps the strongest concern may be levied over the distribution of funding. In California in 1984 the state supplied just over 66%, local authorities 26%, and the federal government 6% of local school board receipts (Bureau of the Census, 1985). The introduction of a voucher system in California would require the state to absorb some additional cost. In Ontario the provincial government in 1983 funded 48.82% of school board expenditure. In per-pupil terms it funded 53% of elementary and 41% of secondary expenditures (p. 110). To provide a voucher to meet average expenditure would require a substantial increase in provincial government expenditure. While local governments might be involved in the supply of education in a voucher system, local governments almost by definition would have only a limited role in the funding of such a system.

Of course the provincial government could provincialize the property tax both residential and non residential as in the New Brunswick approach and in this way make no change in individual burden. However given the current problems of property tax administration it is highly unlikely that provincialization of the property tax could take place without serious efforts being made to reform or equalize assessments to a far greater degree than currently exists.

Even if one accepts the argument that competition can reduce or control costs over the long run, it is unlikely that this prospect will compensate for the tremendous costs which will accrue to the provincial government initially.

The voucher system substitutes parental choice for a concern with the establishment of horizontal equity but contributes little to the solution of problems of vertical equity. There is danger that in the emphasis on parental choice and move towards a substantial element of private funding, that achievement of social goals of harmony and equality of condition as distinct from equality of opportunity will be neglected.

5.5 A General Assessment

Because much of the discussion of the Ontario Grant Structure has, in accordance with the topic of this paper, been concerned with problems, it is necessary to recognize that any system of financing education from public sources present its own particular problems. Furthermore it is more appropriate that a system be judged more in terms of its social and educational results than in terms of technical adequacy. Such evidence as there is suggests that attention in Ontario should be centered upon adjustment to the current system rather than radical reform.

In 1980-1981 Ontario recovered the second highest elementary-secondary retention rate in Canada. (Brown, 1983, p. 16). The rate of 75.4% was second only to Quebec with a retention rate of 84.9%. The indication is that in terms of educational opportunity as provided by programs funded under the existing grant structure Ontario has performed well. Moreover with a post-secondary education participation rate of 20.5% of the 18-24 age group (Brown, 1983, p. 10) second again only to Quebec in Canada, there are indications that the graduates of the system were as well or better prepared than their peers in other provinces for further education.

It must also be pointed out that between 1975-1981 Ontario had the fourth highest rate of per-pupil expenditure in Canada. Both Quebec and British Columbia exceeded the Ontario level (p. 71). Yet in both of these provinces the public pressure for control over expenditure has resulted in a demand for intervention by the provincial legislatures to an extent not currently evident in the Ontario legislature or media.

Ontario in the period 1975-1981 was ninth out of the ten provinces in the annual rate of increase in expenditures per-pupil. Only Prince Edward Island demonstrated a lower annual rate of increase. It is suggested that this data provides strong evidence that the current grant structure provides opportunities for cost control and adjustment.

The discussion has suggested that in using the foundation plan approach to educational finance in Ontario is operating in the mainstream of Canadian systems of educational finance. It has also been suggested that in those provinces which have selected more highly centralized systems of educational finance, there are social, cultural and economic arguments more compelling than technical efficiency which have guided their selection.

The following section of this paper will attempt to suggest some adjustments to the system.

5.6 Summary and Conclusions

1) The foundation plan approach to educational finance originated in the United States in the 1920's and has tended to dominate thinking in the field since that time.

2) Prince Edward Island, New Brunswick and Quebec have highly centralized budgetary and allocation systems. The reasons for electing this approach probably have more to do with the general economic, social and cultural objectives than a special concern with technical efficiency.

3) These systems can concentrate of the achievement of horizontal and vertical equity in educational terms since they are not concerned with the problem of providing equity in terms of local needs and local resources.

4) Centralization of information for program costing is characteristic of these systems.

5) Centralization of salary negotiations is also characteristic of these systems.

6) There is little evidence that centralization per se is effective as a means of cost-control.

7) Two provinces, Newfoundland and British Columbia have been described as particularly centralized in that whilst the provincial government provides or sets strict controls over revenue and total expenditures, the expenditure patterns of local authorities are not dictated in detail.

8) In British Columbia the major concern currently is with limiting expenditure and access to the property tax. There is little evidence that the system of controls is concerned with the achievement of either vertical or horizontal equity.

9) Nova Scotia, Ontario, Manitoba, Saskatchewan and Alberta may be described as decentralized systems in that they reflect the foundation plan approach.

10) These provinces tend to define the foundation level of education in terms of per-pupil expenditure. Grants are directed towards equalizing the effort required to attain these levels of expenditure.

11) The systems in use attempt to achieve vertical equity through a system of weighting per-pupil expenditures.

12) These systems all provide access to the local property tax for support levels of expenditure above the foundation level.

13) Both Alberta and Manitoba make provisions for some degree of equalization where boards go beyond the foundation level.

14) The Ontario grant structure provides for the foundation level through the setting of ceilings. The per-pupil expenditure level is unweighted but weighting is provided for by setting hypothetic enrolment figures reflecting need.

15) The use of weighting formulae has been subjected to severe criticism.

16) The question of adequacy in the setting of ceilings was examined. It was suggested that insufficient data existed to make accurate assessments of adequacy.

17) The potential loss of equity was suggested as a major result of inadequacies in the setting of ceiling levels either initially or in year to year adjustments.

18) A general assessment indicated that in terms of educational productivity, political acceptability, and cost-control the Ontario system compared very favourably with other systems in Canada.

19) The voucher system provides an alternative approach to distributing educational revenues.

20) The voucher system emphasizes parental choice and economic efficiency.

21) Implementation of a voucher system presents the same difficulties in definitions of adequacy as do current decentralized systems.

22) It is doubtful if the voucher system can provide adequately for vertical equity.

23) The voucher system has cost implications which must be considered. The provision of regulatory supervisory and communication services are not cheap.

24) Transportation costs in areas which have no public transportation system might prove excessive if real choice is to be provided.

REFERENCES FOR SECTION 5

Anderson, Barry, "The Costs of Controlling the Costs of Education" in The Costs of Controlling the Costs of Education in Canada, Proceedings of a Symposium on Educational Finance, A.E.R.A., 1983.

Brown, Wilfred, Education Finance in Canada, Ottawa: CTF 1982.

Bureau of the Census, Statistical Abstract of the United State 1985, U.S. Department of Commerce, Washington, 1985.

Committee on the Costs of Education, Interim Report Number 7, Toronto, Ministry of Education, 1975.

Family Control, Berkley: University of California Press, 1978.

Friedman, M., "The Role of Government in Education", in Benson C. (Ed) Perspectives in the Economics of Education, Boston: Houghton Mifflin Company, 1963.

Levin, M., "Educational Vouchers and Social Policy" in School Finance: Policies and Practices, J.W. Guhrie (Ed) First Annual Yearbook of the American Finance Association, Cambridge Mass: Ballinger, 1982.

Manley-Casimir, Family Choice in Schooling, Toronto: Lexington Books, 1982.

Strayer, George D. and Robert Haig, Financing of Education in the State of New York, New York: The MacMillan Company, 1923.

West, E.G., "The Public Monopoly and the Seeds of Self-Destruction" in Manley-Casimir (Ed) Family Choice in Schooling, Toronto: Lexington Books, 1982.

6.0 OBSERVATIONS AND SUGGESTIONS

6.1 General Observations

The discussion in this paper so far would appear to warrant some general observations about the current system of educational finance in Ontario.

1) The discussion of the equity issue suggested that there is growing concern with need to provide for vertical equity in view of the public concern for minorities and special populations. There is no evidence that the current foundation program really addresses the problem. This problem is expected to become more critical in view of the decision to provide funding for separate high schools, and the potential challenges to the system which might arise from the full implementation of Section 15 of the Constitutional Act.

2) Historically there has been greater emphasis on the role of the Canadian governments to bring about equality of condition than in either England or the U.S.A. This is reflected in the high degree of control over educational matters afforded provincial ministries of education. Consequently the potential to 'reform' schools by regulation and legislation is greater. There is also a greater expectation of leadership.

3) One strength of the English system is the existence of a Consultation Council which sets up an intermediate body between municipal and central government to deal with matters of policy implementation in the context of both cost and quality.

4) Five Canadian provinces make provision for public aid to private schools which are largely denominational in character. There is little evidence that the current provisions seriously distort the resource allocation picture in these provinces.

5) The English experience suggests that it is possible to provide for a high degree of parental choice in education within the context of the publicly funded system. Given the high degree of control over interna and externa in Canadian education by provincial governments it seems unlikely that the demand by Canadians would extend to such freedom.

6) The analysis of expenditure suggests that the increases in public expenditure on education have not been unreasonable unless one assumes that teachers are overpaid *per se* and that their conditions of work (particularly pupil-teacher ratios) are unreasonable. There are grounds for suggesting that some modifications in the structure of remuneration may be overdue but that, comparatively speaking, the system has provided for reasonable cost control.

7) It has been shown that Ontario makes relatively generous provision for public education without undue sacrifice. The existence of widespread public concern over educational finance suggests that concern might more result from the heavy reliance on the property tax as a source of funding as much as the actual level of expenditure.

8) The review of funding systems revealed that there is one major problem which effects all systems of funding from the most highly centralized to the most decentralized. That problem is defining in operational terms the amounts of money which will provide for 'basic' or 'foundation' levels of education. The problems may be less acute in wholly centralized systems because of the separation of allocations from revenue sources. In foundation plans the use of an measure of average expenditure which is politically defensible is difficult to justify educationally.

   The basic problem lies in the absence of definitions of program in educational terms and associated measures of cost. There is a need for program cost analysis and the development of standard cost measures.

9) A further major problem of all approaches to funding is the difficulty of separating public and private benefit. The separation of the two forms of benefit should be associated with the separation of public versus private cost. Such difficulties are not peculiar to education but are apparent in the provision of any public service in which the benefits are separated from the direct cost of such services.

6.2 A Three Tier System

The following system of funding is suggested in the light of the previous discussion. The system is described as three tier because it provides for decision-making and resource allocation at the provincial, the municipal and the school level. It is based on two general principles.

1) The need to provide vertical and horizontal equity in the delivery of a basic education program.

2) The need to provide an increased degree of real local decision-making and parental choice over matters which are of local and private concern.

(i) The First Tier of Support

The first tier would recognize the principle of providing horizontal and vertical equity in the delivery of a basic program of education. The role of the first tier would be different to the responsibility of the provincial government in the normal foundation approach in three major ways.

To begin with the foundation program should be conceived as a very limited program consisting of considerably less than is currently thought of as being 'basic'. It would consist of the provision of programs dealing only with those skills and learnings which can be justified as being of purely societal benefit and necessary for living. Clearly the widest public and legislative input would be necessary for the formulation of such a program.

Secondly, the foundation program should be expressed in educational terms not fiscal terms. It might be described in terms of educational achievement (outcomes) or in terms of prescribed courses and content (processes). It should not as do current programs emphasize the expenditure definition of a foundation level (inputs).

Thirdly, the cost of providing the basic program would be borne by the provincial government. In order to reflect the educational thrust of the foundation program, it would be necessary to develop a range of standard costs which would ensure that the program could be available to all students in the province. This might result in substantial differences in expenditure per pupil for different locations but it would ensure that horizontal equity in terms of the same basic program of education could be attained. At the same time the achievement of vertical equity through the provision of compensatory resources would be simplified.

At first glance the first tier would appear to require substantial additional resources. There are grounds for arguing that this would not necessarily be true.

First, since the proposed foundation program would be smaller in terms of its expectations, delivery of the program would entail the purchase of fewer goods and services. Secondly, the current funding program provides more provincial support for areas which are poor or which have demographic or geographic factors which limit class size and therefore provide tacit acceptance of the need for different levels of standard cost. In fact what has been suggested is that the differential levels of funding currently being provided be based on educational rather than financial conditions.

The role of the provincial government in this system would first be responsible for defining and assessing the delivery of the basic program. Secondly it would be responsible for developing the range of standard costs associated with delivery of the program in different jurisdictions and thirdly it would provide the financial resources to school boards necessary to deliver the program. The provision of financial support for foundation programs should be confined to schools operated by school boards.

Although the implementation of such a system would be made technically easier by the institution of a province wide salary schedule it is not considered absolutely essential. The review of funding systems has suggested that centralization of salaries and their negotiation is an essential part of full provincial funding as in Quebec, New Brunswick and Prince Edward

Island. The foundation approach does not require it. Greater technical efficiency, better resource prediction, and cost-control could be introduced by the adoption of a Burham type system. It is conceded however that no matter how logical such a system appears, it would probably prove difficult to engage the support of the teacher organizations. However it is possible to provide for variation in salary in the three tier approach.

For instance, if variations in salary are considered to be variations in price rather than quality then it would be quite possible to develop standard costs based on a hypothetical 'average' or 'normal' salary for a board. The responsibility for funding any excess over the normal salary would be then shifted to the second tier.

As noted the development of a system of program analysis would be critical. However the cost-analysis needs to be associated with program and quality dimensions. It has been suggested that the development of an intermediate body between the school system and the Ministry of Education would provide a suitable basis for the analytic work necessary.

This body would be similar to that which exists in England and to IMB recommended by the Bovey Commission on University Education.

(ii) The Second Tier of Support

The second tier would be funded on the basis of an equalized property tax restricted to residential property and would reflect the principles of local control through currently existing school boards. The local board would be responsible for a range of curricular offerings not necessarily constrained by the Ministry of Education. Such offerings could take the form of extensions of the minimum curriculum or the introduction of totally new courses or programs designed to meet local needs. It might also provide for differences from the provincial salary scale if local pressures warrant. Whilst working conditions for funding the foundation program would be included in the development of standard costs, local boards could negotiate working conditions with local teachers and provide for costs above the standard.

The recognition of parental choice, local control and equity both vertical and horizontal would be reflected by the second tier.

Essentially the second tier would consist of the current system of school boards with their responsibilities and their funding changed. The boards would have little control over the foundation program and their efforts could be directed towards extending the basic programs in accordance with regional or local needs. They might choose to introduce new courses or provide improved working conditions for teachers employed in delivering the core program in the event that the single salary schedule approach proved difficult to implement.

Funding for the second tier would be on a basis similar to that currently used but with modification. The non residential property tax would be excluded from the board base. Since the fiscal responsibility of the board would not include the basic program there would be less need to worry about the amount of provincial aid to be provided to supplement this basic level. The level of local board expenditure supported could be reduced to the 25-30% level provided that equalization in the form of support inversely proportionate to wealth was provided.

Adoption of the three tier approach might provide a framework with which some support might be provided for independent schools.

For instance, school boards might purchase programs of a popular but special nature from independent schools. In this way the concern over comprising the principles of the need for basic education with the need to provide a measure of personal choice in schooling could be reduced. The adoption of this system might also provide a solution to the problems of extending funding to separate high schools.

The critical condition for the local board to meet would be the need to provide access for all students in the jurisdiction to the programs offered. At this time there is frequent violation of the principle of equal access for equal taxation. Parents are increasingly conscious that not all schools within the jurisdiction of a board offer the same level of quality or varieties of programs and yet (within the limits of the assessment system) they are making the same contribution. It might even be argued that the potential for violation of horizontal equity in large school boards is sufficient to offset the claim of administrative efficiency which is used to support the centralization of school administration.

(iii) The Third Tier of Support

The purpose of introducing the third tier is to permit a higher degree of parental choice without compromising the degree of equity offered by a fully funded state system.

The program accounted for by the first two tiers might amount to some 75% of the total. The remainder should be provided on a purely local basis by the institution, at the school level management committee (elected, appointed by the school boards or a combination of the two). Independent schools would be unaffected.

The proportion of the program for which the school community is responsible could be defined in terms of a proportion of the total budget or in terms of time. Revenue would be provided by the provincial government in the form of a voucher redeemable at any school in the community or, if tighter control were desired in the form of a grant to the school from the provincial government directed through the school board. Parents could opt to spend their vouchers at public or independent schools. However in order to prevent public schools from competing at a disadvantage to independent schools, the conditions under which these 'private' programs would be offered would be the same in both systems. Thus the requirements for adherence to Ministry curricula would be relaxed as would the requirements for certificated teachers. They should also be exempted from any employment contracts which governed the programs offered by the first two tiers. In other words the activities of the third tier would be governed insofar as possible by purely market forces.

Parents might be permitted to add to the value of the voucher additional resources but the amount should be strictly limited insofar as the public system is concerned.

The creation of the third tier of funding might have beneficial results in addition to those usually connected with the provisions of parental choice through the voucher system.

It might, for example, simplify (but not eliminate) problems associated with maintaining neighbourhood schools in situations of non-economic enrolment. The provincial government would be expected to make a decision as to whether a school could be operated within standard costs. If not the choice as to whether the school would remain open would rest with the third tier and the proportion of local resources or fees which would be required would be the difference between the real cost of providing the core program and the standard cost of the core program. In this way the significant element of private benefit resulting from the maintenance of uneconomic schools at public cost would be reflected.

FINANCING PRIMARY AND SECONDARY EDUCATION:
OBJECTIVES AND MEANS

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Financing Primary & Secondary Education: Objectives and Means

I Centralized or Decentralized Finances?

Any expenditure on education, either by the public sector or by an individual household, should be viewed as an investment in human capital. The returns to such an investment are, broadly, twofold; an enhancement of the lifetime utility of the individual and the overall improvement in the society to which the recipient of the education belongs.

Several major inputs associated with this investment process are relatively easy to measure. In quantitative terms, the student-teacher ratio, the per pupil library collection, the number of computers and the breadth of facilities can be collected and analyzed. Some of these are directly linked to the quality of the education service being provided while for others, the link between a quantitative measure and quality is more tenuous. The quality of the teacher, for example, may offset the student teacher ratio and the use of a library may be more important than the number of books per pupil. The quality of books is obviously important also.

There are clearly difficulties accompanying any attempt to measure the inputs associated with education but they are rather minor when compared to the task of measuring the output from education. At first glance, one is tempted to use broad data such as the percent of an age group achieving a secondary school diploma, or community college degree. These data reveal little about how education enhances an individual's utility or improves society as a whole.

Broadly speaking, the benefits from education can be classified into a monetary one, through higher lifetime income (or at least the opportunity of a higher lifetime income), and a non-monetary benefit in the form of a greater enjoyment from leisure time and more appreciation of the human and physical world. But what of the contribution education makes to society at large? What is it? Can it be measured?

One of the most widely used social indicators is education; as the percentage of the population achieving specific levels of education rises, the well-being of the society improves. To the extent that education improves per capita income and income is also a measure of social progress, the education-societal improvement link is indirect. Very few would argue, however, that it does not exist. A direct link between education, per capita income and social well-being can be made. To the extent that public goods, including the redistribution of wealth, are viewed as luxury goods with high income elasticities, social goals are more easily attained when per capita incomes are rising and to the extent this rise in income is a return to education, the link is firmly established.

But an educated society also promotes, it is argued, increased tolerance, more political stability and a greater degree of flexibility in adapting to change. These attributes of an educated society are difficult to measure but they are precisely the ones employed to buttress arguments in favour of public support of education. The individual, if left to his or her own to purchase education, would do so up to the point where the last dollar spent was equal to the marginal expected private gain from that unit of education. Because individuals do not take into account societal benefits, each person will purchase a sub-optimal level of education, and collectively, society will be worse-off. Public support at one or more levels of education, in full or in part, pushes the collective consumption of education closer to the optimal in terms of resource allocation. Precisely what tier of government in a federal system should provide this public support is another matter.

Resource allocation is not the only issue. A key consideration in the financing of education is the question of personal income distribution and the distribution of wealth among communities in the Province. To the extent the cost of education is borne in part by the individual consuming the service, the incidence of the cost is not the same for all individuals if income and wealth differs across individuals. Equality of opportunity is therefore limited by the market-determined distribution of income. The problem disappears, of course, if individuals are not required to allocate any private resources, other than the opportunity cost of their time, towards the consumption of education.

Indirectly, however, equality of access (financially) may be denied even in those circumstances where education is financed through the public sector by political jurisdictions which do not enjoy similar per capita or per household levels of income and wealth. Given roughly equal per capita costs of education across municipalities a given ″bundle″ of education services per pupil will impose a disproportionate burden on taxpayers in less wealthy municipalities. If education from the community's perspective is income or wealth elastic, the provision of per pupil real education will vary across jurisdictions. Consequently, even with full public sector funding of education, equality of opportunity will be denied.

The strong possibility of unequal opportunity of education in a multiple jurisdiction framework (in terms of the provision and financing of education) has led some people to conclude that primary and secondary education must be the responsibility of the Provincial government or, without the constraints of the Constitution, of the federal government. Equality of opportunity across jurisdictions within a province and across provinces would be guaranteed.

In recent years, a strong theoretical case has been made for the decentralized provision of public goods. Oates (1972), Tullock (1969) and Barzel (1969) have demonstrated that welfare is no worse off and may well be improved if a public good is made available on a decentralized rather than centralized basis. The result, however, only holds true if (a) there are no cost advantages of transferring the activity to a more centralized administration and (b) no interjurisdictional spillovers. The first constraint is straightforward; the greater the reduction in per capita cost under centralized provision the more likely the net gain from centralized provision of the service. The second constraint is more complex but it basically states that if the benefits of a public service flow beyond a given jurisdiction to other jurisdictions there is a case for the centralized provision of the service or at least involvement by a higher tier of government. This is the classic case of an externality or third party effect at the level of market exchange. In the presence of externalities, exchange is inefficient and efficiency requires collective action to either tax or subsidy the exchange.

How important are these factors in the case of elementary and secondary education? There are obviously economies of scale as schools are joined together in groups represented by boards of education. Large volume purchases of materials and transportation development are two obvious areas. Would further amalgamation into several regional districts produce further cost savings? Ultimately, would one school board, for the province, reap even further economies of scale? There is no empirical answer to that question but one suspects that a single school board for the province would lead to classical diseconomies of scale and higher per pupil costs of education.

The population of a jurisdiction and thus cost per pupil cannot be the sole criterion in establishing school boards. The mix of urban and rural densities as well as the existing political system involving cities, counties and townships must be respected and the present configuration of school boards may well be the best result, given the constraints.

As noted above, the welfare gains postulated under the decentralization theorem require the non-existence of interjurisdictional spillovers: that is, the size of the unit chosen to provide the service is of such dimensions that the benefits of the service are contained within that jurisdiction. To the extent education is privately consumed there are no externalities. It was argued above, however, that certain aspects of education, or outputs from education, are of general benefit to society. In fact, if society agrees to finance the total direct cost of education up to a certain level, it (society) is admitting to a significant scale of externalities associated with education, at least up to a particular level.

But do these benefits go beyond the jurisdiction providing and financing the service? If we make the highly reasonable assumption that individuals are mobile among school board districts and that many persons will not be employed in the geographical area where they received their primary/ secondary education, the externalities associated with education are significant. The decentralization theorem is repudiated.

Repudiation of the decentralization theorem does not automatically mean that primary and secondary education ought to be financed and supplied by provincial governments for if the potential benefits go beyond the school district where the student was educated to all parts of the country, a case can be made for at least minimum uniform standards of education across the country. The empirical question, of course, is the magnitude of the externalities and the extent to which the recipients of education are mobile across jurisdictions. In some multi-jurisdictional systems, such as Japan, the central government does play a major role in the structure of primary and secondary education in the country. Japan, however, is a geographically small country with the likelihood of a high degree of labour mobility throughout the country. The U.K. is also an example of a country where education policy and finance is in the hands of the central government. Without generalizing too confidently, it would not be unreasonable to expect very large countries to be characterized by a greater degree of decentralization in the provision of education than small countries.

In a world of perfect information, costless transactions and a constant marginal cost associated with bureaucracy, the degree of externality might well be the dominant factor in determining the allocation of education responsibilities and finance among levels of government. None of these conditions, however, hold true and because of that, decentralization of education bestows certain benefits beyond those associated directly with the decentralization theorem. First, in a small group setting, information flows more easily among participants when distances are short and the number of persons involved in decision-making is small. Problems are recognized and diagnosed quickly and remedies dispatched with short lags. In the case of education it would be difficult to argue that identical problems exist in all communities. Demographic features, ethnic mix and socio-economic factors will require different approaches to the provision of education and a single central authority would not be able to provide such a disaggregated approach. Even if the financing of education was the responsibility of the central government, the provision of many of the characteristics of the service would necessarily have to be carried out at the disaggregated level. Second, time is money and the myriad of transactions required to supply education services must be costed with economy in mind. While some economies of scale can be reaped through buying on a volume basis, the timing of purchases is also important and can best be dealt with, at minimum cost, by a unit when needed. Third, there is general agreement that the overall cost curve of bureaucracies is U-shaped: once the number of employees reaches a certain number, the cost of supplying a good or service begins to rise at an increasing rate. The evasive question is what is the optimal size of an education bureaucracy?

All of these issues are in fact subject to empirical verification, at least in terms of how important they are in the overall cost of providing a public service such as education. Nevertheless, it appears that a strong case can be made for decentralizing the provision of much of primary and secondary education. That does not mean decentralization of the basic curriculum of education. Some degree of decentralization may be desirable in this area but for reasons other than those discussed above.

Nor does it mean that the financing could not be centralized. One could, without too much difficulty, adopt the Nova Scotia proposal (Report of the Royal Commission 1974) whereby all non-residential real property taxation would be transferred to the Province and returned to school boards on a per pupil basis thus equalizing, in effect any wealth differentials. School boards would still have all but one of the functions they now perform. The municipality could retain the use of the business tax to finance municipal services which are of a direct benefit to the establishment and running of a business. This reform would also eliminate the problem (to be discussed in Section III) associated with differential ratios of non-residential to residential assessment across municipalities. The only strong argument against such a reform is that it prevents those communities which want to spend more than the provincially-determined amount on education from doing so. Whether this is desirable or not is largely a political question.

II The Concept of Wealth Neutrality in Education Finance

There is, in the theory of local government public finance, a prevailing view that the autonomous, decentralized financing and provision of certain services approximates a "quasi-market" situation where households can express their preference through voting for the mix and level of public goods by choosing where they live. Such a ´selection process´ can give rise to a wide variation in the real per capita level of a given public service regardless of the ability of the community to pay for such services. In a less wealthy community, the preferences of the majority may dictate high per pupil expenditure on education and high per capita levels of real consumption of other public services such as police protection, recreation, transportation and fire protection. A much more wealthy community, in terms of per capita income or average property tax assessment could opt for a low level of public goods expenditure, including education. This would reflect a strong preference for private over public goods. Similarly, communities of equal wealthy may exhibit very different per capita levels of public goods spending.

Over a fairly broad range of wealth, it is usually accepted that local public goods are income or wealth elastic and hence, normal goods in the usual theoretical sense of the word. One would therefore expect to find a positive correlation between per pupil expenditure on education and per capita wealth across communities in a given province or country. This also applies at the federal-provincial level and has given rise since the days of the Rowell-Sirois Commission, to the debate on equalization grants as a means of reducing province by province variation in per capita spending on public goods (for a given tax effort) or ensuring that roughly comparable services on a per capita basis do not give rise to significant unequal tax burdens across provinces.

This same principle can be applied to provincial-local public sector relations and has, in fact, been embodied in fiscal arrangements in Ontario and other provinces. With respect to certain public goods, it has given rise to debate surrounding what has been referred to as "the principle of categorical equity". This principle embodies two somewhat different operational concepts;

1. individual consumption of certain public services should not be allowed to vary, or,
2. differences in per capita consumption of these same select public services should not vary because of differences in ability to pay.

It is extremely important to distinguish between the two streams of analysis. In the first instance, considerations of efficiency-related decentralization are overruled by the equity directive that all citizens must be equal, not just have the choice of being equal. The second proposition subsumed under the principle of categorical equity has been referred to in the literature as wealth neutrality (Feldstein, 1975). The principle of wealth neutrality was underscroed (legally) in the U.S. in the 1971 California Supreme Court decision where the court ruled that education related to local financial conditions was illegal because, "...it makes the quality of a child's education a function of the wealth of his parents and neighbours." (Harvard Law Review, Nov. 1971) The court did not invoke the first proposition of categorical equity--that each school district spend the same amount per pupil on education--nor did it rule out the use of the property tax as a legitimate source of funding. It simply ordered the state to find new methods of funding primary and secondary education.

Wealth neutrality is a somewhat broad and nebulous term, defying any precise base for measurement purposes. In the case of education finance in Ontario, it would be synonymous with the assessed value of property since by far the largest share of local tax revenue is derived from this source. This would be true of other provinces in Canada and states or provinces in other countries.

In strict terms then, the concept of wealth neutrality implies that the elasticity of per pupil expenditure on education with respect to the value of assessed property per pupil be zero. This concept can perhaps be explained with the use of a simple hypothetical example where it is assumed there are no intergovernmental grants.

Table 1
Wealth Neutrality and Expenditure Elasticity

Jurisdiction	Per Pupil Expenditure on Education	Per Pupil Assessment	Elasticity of Expenditure with Respect to Assessment
1	2,000	15,000	base
2	2,200	16,500	1.0
3	2,200	17,000	0.0
4	2,250	20,000	0.129
5	2,400	20,000	

In the case of jurisdictions 1 and 2, the elasticity is 1.0; expenditure is proportional to wealth. A wealth neutral response is shown in the comparison between jurisdiction 2 and 3 where the higher assessment has no relationship to expenditure. The elasticity measure when comparing jurisdictions 3 and 4 suggests a response close to zero (wealth neutral). However, the concept of wealth neutrality is somewhat more difficult to grasp when comparing jurisdictions 4 and 5. Per pupil assessment is unchanged but expenditure is higher by 6.7 percent in jurisdiction 5 compared to 4. The elasticity measure is therefore infinity! What this suggests is that for reasons other than wealth, the demand for education is higher in jurisdiction 5 compared to 4. In that sense, expenditure is wealth neutral.

The major problem with this concept of wealth neutrality is the use of taxable assessment as a measure of wealth. Empirical work (in the U.S. at least) has shown that the correlation between assessment and income (per pupil or per household) is not very high. While the implicit income from home ownership forms part of one's wealth, it is measured income that is required to pay the tax. If the argument is to be made that local spending should have no correlation with the community's ability to pay, then a much broader definition of wealth is needed. If a regression were run on cross section, time series data of the form

$$\ln E_j = a_0 + a_1 \ln W_j + u_j$$

where E_j and W_j were per pupil education expenditure (no grants) and per pupil property assessment in education district j, a positive value of a_1 does not imply a lack of wealth neutrality. What is required is a more comprehensive relationship of the form

$$\ln E_j = a_0 + a_1 \ln V_j + a_2 \ln Y_j + a_3 \ln A_j + e_j$$

where V_j represents property value assessment, Y_j income and A_j the age distribution of the school enrolment. In this formulation it is the combination of V and Y which captures any wealth effect with the degree of wealth neutrality indicated by the sum of the coefficients $a_1 + a_2$. The age variable is necessary to capture the fact that expenditures per pupil are likely to rise as one moves from early primary grades to senior high school classes.

If the educational system is characterized by a system or systems of grants, the E_j will reflect expenditure financed from local revenue plus intergovernmental grants. To test for wealth neutrality requires a modification to the above equation such that the term $a4 \ln P_j$ be added where P_j is the net price paid per dollar of education expenditure. P_j is equal to $(1-M_j)$ where M_j is the amount of provincial aid received per dollar of local spending on education.

Wealth neutrality can be achieved by varying the size of M_j. If both pupil assessment and income are very low relative to the `richest′ community, $M_j$ will be large. Does the basic Ontario grant achieve complete wealth neutrality? Without a well-specified grants model and statistical testing, the question cannot be answered, but we can say something about the relative impact of both the old and `new′ system in terms of wealth neutrality.

The system prior to 1977 was known as the Variable Percentage Grant Plan (VPG) and its objective was to ensure that

> "...the financial burden of each school board jurisdiction should be directly related to its level of expenditure and, second, that all jurisdictions, irrespective of local wealth, should have an identical mill rate for a comparable level of expenditure."
> (Ontario Ministry of Education, 1984)

This implies that if one jurisdiction spends 10 per cent more than another, its taxes will be 10 per cent higher. However, if the amount spent per pupil in two different jurisdictions is the same, the mill rate needed to generate that expenditure will be identical in both jurisdictions.

The current (post 1977) system is known as the Mill Rate Equalization Plan (MRE). The basic philosophy is one of equal yield for equal effort.

> "...all school boards with the same mill rate (effort) on their equalized real property assessment will have the same financial revenues per pupil (yield) through a combination of local property tax revenues and provincial grants."
> (Ontario Ministry of Education, 1984)

The Province determines a level of per pupil expenditure on education and sets a common tax rate. The yield derived from this common mill rate multiplied by the local equalized assessment is then compared to the total 'recognized' expenditure and a grant to cover the difference is transferred to the school board.

The following example will help to illustrate the difference between the two schemes and their relationship to wealth neutrality.

	School Board		
	A	B	C
1. No. of pupils (N_j)	1,000	2,000	2,000
2. Equalized Assessment (A_j)	\$150M	\$150M	\$300M
3. Recognized Per Pupil Expenditure (E)	2,297	2,297	2,297
4. Equalized Mill Rate r^e	7.813	7.813	7.813
5. Rate of support variable (R) for "Average" Board	48	48	48
6. Number of Boards (n)	3	3	3
7. Actual Per Pupil Expenditure (E)	\$2,600	\$2,100	\$2,400
8. Total Actual Expenditure	\$2.6M	\$4.2M	\$4.8M

The formula for the VPG plan is $G_j = r_j.E.N.$ where

$$r_j = 100 - \left[\frac{(\bar{R})(A_j^e/N_j)}{\sum_1^n (A_j^e/N_j)/n} \right]$$

where r_j is the rate of support for the jth board. For the three boards, the following results emerge.

Board	Value of (r)	Total Grant (G)	Grant per Pupil	'Own Expenditure' Per Pupil
A	42.2	\$1.097m	1,097	1,503
B	71.9	3.020m	1,510	509
C	42.2	2.026m	1,013	1,387

With the current MRE scheme, the formula is

$$G_j = N.E - R^e.A_j$$

where G_j is the grant. This results in the following:

Board	Total Grant (G)	Grant Per Pupil	"Own" Expenditure Per Pupil
A	\$1.125m	1125	1475
B	\$2,762m	1381	719
C	\$2.250m	1125	1275

The important feature about the current scheme is its complete insensitivity to expenditures above the provincially determined E. The per pupil grant to Boards A and C are identical because they have identical per pupil assessment but any expenditure effort beyond the provincially-determined E receives no support. In addition, differences in per pupil expenditure by boards with identical per pupil assessments are not reflected in any different grant support. In the earlier scheme, additional expenditure was supported by the provincial grant. The current scheme is wealth neutral up to the value of E. Beyond that, however, the cost of financing an additional dollar of expenditure will mean a higher mill rate, the less wealthy the jurisdiction.

III The Composition of the Local Revenue Base

Another important element in the financing of education is the composition of the revenue base from which local boards draw their funds. There are two distinct dimensions to this problem; the composition of the tax base and the use of property taxes to finance education.

III(a) Property Tax Base Composition

All urban boards have a mix of residential and non-residential assessment while county boards which will have agricultural assessment in their tax base, may then have three assessment bases from which to draw property tax revenue. While the tax burden is equalized up to the provincially-allowable per pupil expenditure, education expenditure beyond that level must be financed with additional levies on one or more tax bases.

In communities with a substantial portion of the total assessment represented by commercial/buisiness activity, the burden of any increase in tax revenue per pupil on residential property is far less than in those communities where the assessment is almost all residential. While it is likely that a substantial burden of the residential tax will be borne by the owners of these properties there is a much greater likelihood that the tax on commercial/industrial property will be exported outside the community. (See Auld, 1985 for a review of this issue) Since it is residents who possess the voting power and for the most part are parents of children in the schools, there will be a natural tendency to favour increased taxation for education purposes in communities with large commercial/industrial tax bases, irrespective of differences in wealth. While wealth neutrality may be achieved through a system of grants, the mix of assessment may result in different marginal expenditures per pupil with attending different qualities of education across school board districts.

It is possible that the existence of a large block of commercial/industrial assessment could lead to a tendency in the opposite direction if such assessment represented business activities where the prospect of tax shifting was limited. The owners of such properties might represent a strong lobby against further tax increases on the grounds that additional levies would threaten the existence of their businesses.

Can either of these effects be neutralized? There are at least two possibilities. First, as noted earlier non-residential assessment for education purposes in all communities could be taxed by the province and the proceeds of this taxation then redistributed to school board districts, along with other grants, in accordance with whatever system of equalization is in effect. This would also have the advantage of ensuring identical tax rates per unit of capital across the province, eliminating any possible distortions that arise from unequal tax rates that are not benefit related. A second option would be to eliminate the education component for non-residential assessment. This would, to maintain per pupil expenditures on education, require higher residential taxation or an increase in some provincial tax (e.g. the corporate income tax) with a transfer of the proceeds of such a tax being returned to school boards.

Whether or not such a reform should be seriously contemplated depends to a significant degree on the actual distortion which results from the variability of the residential/non-residential assessment ratio. No empirical work in Ontario exists at this time to answer the question. It should be done. Alternatively, it could be argued that the existence of a variable residential/non-residential assessment ratio is sufficient evidence to suggest the possibility of a distortion in school finance and this alone warrants reform along the lines suggested above.

III(b) Local Revenue Base for Education Finance

The local revenue base for education finance is the real property tax and it is the reluctance to tax this base at higher rates that is contributing to the crisis in financing education. Unlike the trend in the 1970s, the Province is not likely to reverse the present trend of reduced funding (proportionately) for education. Some reduction in the rate of increase is justified in light of declining school enrolments but current reductions, it is argued, cannot be explained just by enrolment declines. If the quality of education is to be maintained or increased, further local source funding will be required. Setting aside an expansion of property taxation, what alternatives exist?

Within the control of local governments, an expansion in the use of lot levies or fees would be possible. Since such charges are tied closely to development strategies, few municipalities would, on their own, proceed with significant increases in this area. A potential source of revenue might be the proceeds of an `education lottery´ but it is likely that provincial and/or federal approval would be necessary to expand in this direction. Still, given local government´s limited access to tax bases compared to provincial and federal governments, there could well be considerable public sympathy for this venture.

When it comes to local access to income and sales taxes, the options here have been discussed on several occassions. (Auld, 1980, Johnson, 1973) Simply put, the province would permit local school boards to impose a one or two percent income tax or a one percent sales tax in the board´s geographical area. Since the tax would be the same rate in all areas, there would be no incentive to minimize the tax burden by moving. Such a plan would result in very different per capita revenues and to ensure equal opportunity on a per pupil basis, some form of equalization would be needed. If this reform in education financing was accompanied by a reduction in the property tax rate, it might indeed generate considerable support.

These, and other conceivable expansions to the revenue base of the school board should only be contemplated if increased use in the property tax is ruled out as an option.

In the 1970s, the Provincial Government became concerned about the extent to which education was being financed by property taxes because of the regressive nature of the tax. The Province moved to increase the share of education expenditure financed by grants so as to broaden the overall tax base, a trend that has slipped in recent years. Since the mid 1970s the alleged regressiveness of the property tax has been challenged. Recent analysis by a number of scholars has concluded that the property tax is a tax on capital and is therefore progressive in its incidence. (See Auld, 1985 for a summary of this debate) Others have not been quite so hasty to adopt this view. The prevailing wisdom is perhaps best summarized by Bird and Slack (1983).

> "... it is probably safe to conclude that the conventional view almost certainly overstates the regressivity of the property tax..." (p. 68)

While this view is likely to gain acceptance only in the longer run, it does suggest that reform to the existing property tax and expansion of its use might not only be a good thing but much more politically acceptable than any other option. The needed reforms have been spelled-out in detail (Kitchen, 1984) and involve largely changes in assessment practices and the proper balance between residential and non-residential property taxes.

IV Vouchers For Educational Purposes

In May of 1985, the new Ontario Minister of Education suggested in an interview that the voucher system of financing education warranted attention by his office. It is an old idea which from time to time is resurrected, debated and then buried again (Friedman 1955, Peacock and Wiseman 1964). The Minister's statement has once again introduced the concept into public debate and no analysis of education finance would be complete without a discussion of the voucher system.

A voucher system can best be described as

> "...the distribution to all parents of vouchers exchangeable for education at any school, state or private, that satisfies minimum education standards, the value of the voucher being related to the average costs of education according to the age of the child" (Blaug, 1967, p.34)

Under a voucher scheme, public schools would charge a fee to cover costs. Private schools might well charge above the minimum and supply additional services. The scheme has its advocates and dissenters and it is useful to review the advantage and disadvantages of such a proposal.

Advantages of the Voucher System

1. A 'double' system of education would provide competition among schools, raising the standards in both and encouraging innovation.
2. The schools would be much more responsive to the wishes of parents.
3. On a per pupil basis, expenditure on education would likely increase.
4. The property tax, with all its problems of fair assessment and equalization, would no longer be used to finance education,

5. A wider range of educational experience would be available allowing diverse preferences for education to be better satisfied.

Disadvantages of the Voucher System

1. The differences in education that would emerge would result in graduating students having very different skills.

2. The private schools would admit only the 'brightest' students and bid for the best students resulting in a two-tiered system of education, resulting in a social stratification in education.

3. Any extra financing for education would come from high income parents and only for their children.

4. Since education (above the minimum) would be distributed in accordance with wealth, the future earning capacity of those who already have wealth, would be enhanced, thereby 'locking-in' the existing distribution of wealth.

Further Reflections on the Voucher System

In the matter of the ability to pay for additional education (beyond the minimum expenditure required), the value of a voucher could be related to income and the number of school aged children in the family. The very wealthy could, conceivably, receive no vouchers while for the very poor, vouchers of 20, 30 or more per cent above the minimum expenditure required could be distributed. Since the voucher would be non-transferable and only be exchanged for education, parents of children in poor families would be encouraged to send their children to schools of higher 'quality' or select a wider range of education activities.

More important, however, is the different role for the parents under a voucher system. The choice of education for children is likely to broaden considerably and the question becomes much more philosophical: how much of a role should parents have in selecting education services for their children?

At one extreme, it could be argued that maximum choice is desirable since parents are competent to make sensible choices. Income related vouchers and a minimum standard in public schools will ensure that significant mistakes cannot be made. If parents are `trusted´ to elect school boards, they are competent to choose the right schooling for their children. Others have argued that state or public education is needed to save children from the choices of their parents.(Vaizey, 1962) Parents would, in choosing the education institution for their children, direct them in too narrow a fashion. A compulsory, common and broad education system allows for the full potential of a student to develop over time.

The most compelling argument against the voucher system is the tendency of such a system to reduce social cohesion and emphasize class, religious and race differentials. A voucher system would spawn schools dominated by religious groups and sects which would be in a position to `capture´ the minds of young people in perpetuating certain beliefs. There would be nothing wrong with this unless, of course, such teachings led to intolerance towards other religions or those attending non-denominational schools. A state run, non-religious school system is a `melting pot´, and with an appropriate curricula, can teach tolerance, understanding and appreciation of all cultures and races. To ensure that a more heterogeneous system supported by the voucher scheme did not lead to social divisions through certain teachings, the curricula of all schools could be closely monitored. While this might be an effective `watchdog´ it would in part validate the basic objectives of the voucher system - the development of an independent, innovative school system.

There are certain practical issues associated with the voucher system. Would, for example, parents be able to choose a different school for their children each year? Could children of the same family attend different schools? Currently, the capital needs of school systems are planned on the basis of forecasts of urban and rural development plans and the changing distribution of school age children. A freely operating voucher system would render any planning obsolete. Attendance at any one school would parallel a stochastic process. Some planning would be necessary to prevent situations of considerable excess capacity and over crowding.

The unwillingness of governments to use voucher schemes for education can be traced not so much to the cogency of those opposing such schemes but to a lack of concrete answers to some very specific questions. It is likely that such a scheme would extend the range of choice in education, expand the private school system and probably lead to more resouces devoted to education. But society still need answers to the following.

1) Can the competition among schools that would result from a voucher scheme be regulated to prevent misleading advertising?

2) Even if the vouchers are inversely related to income or taxed at family marginal tax rates, will they lead to a higher demand for education among disadvantaged groups?

3) Can `balkanization´ according to race, colour or religion, be limited?

4) What planning procedures would be required to ensure the optimal development of capital facilities and development of teachers?

The voucher system of education cannot be rejected outright but the uncertainty of its impact all but rules out its introduction in Ontario. A limited application of a voucher scheme might provide some answers to the questions above but such a social experiment is not likely to take place. The introduction of a voucher system at the post secondary level of education would provide much needed insight into the practical aspects of the scheme. Whether or not the results in this case could be applied to education finance at the primary and secondary level remains to be seen. We would, however, clearly have far more information than we have at present.

V Conclusion & Summary

Any recommendation to reform the current system of financing primary and secondary education must be made with political reality in mind. The most important reality is the limited scope for direct increases of any significant magnitude from the Province to school boards. Provincial revenue growth is considerably slower than it was in the mid 1970s and with a stubborn deficit, along with demands for direct job creation, the options of the Province are severely limited. The decision to extend financial support to Separate School Boards further limits general increases.

Yet there appears to be a growing sense among the population that per pupil expenditures on education should rise to reduce pupil teacher ratios and expand certain facilities.

While the complete privatization of education with generous tax credits may appeal to some as a means of increasing education expenditures, it is, politically, unlikely to even obtain a hearing. Much more likely is reform to the current system involving one or more of the following elements.

1. A transfer of some or all of the non-residential tax base to the province with the proceeds being transferred back to the school boards on a cost-adjusted per pupil basis.
2. A change in the basic grants to ensure that expenditure per pupil on education is wealth neutral or as close to wealth neutral as possible.
3. Provincially sanctioned education lotteries to support capital projects at the primary and secondary school level.
4. A "phased-in" (over 5 or 10 years) substitution of an income or sales tax flow through to school boards for the present education tax on residential property.

These reforms would make the education finance system more equitable in terms of equal opportunity and at the same time expand the revenue base. While reforming the current property tax by moving to province wide market value assessment every five years would improve things, from a cost point of view, an automatic income or sales tax flow through would be far less costly and ensure boards of a growth revenue over the long run. Changing any public sector system always presents problems but if the advantages of reform are made public and stressed, support for changes to the existing structure to finance education can be generated.

APPENDIX

A Brief Review of Statistical Models on the Determinants of Education Expenditures

In this Appendix, we address three questions related to statistical/econometric studies on educational expenditure per student. These are:

1. How effective is government aid in increasing education expenditures?
2. What other variables are important in determining educational expenditure?
3. Can grants to local government for education be considered "wealth neutral"?

1. The Impact of State/Provincial Grants on Local Educational Expenditure

The effectiveness of government aid greatly depends on the manner by which the aid is administered. The econometric evidence on grant impact, which pertains almost exclusively to the U.S. system, involves the following type of grants.

Block grants: These are lump-sum payments with "no strings attached". They act as an income supplement. (Feldstein, 1978)

Closed ended Matching grants: The state (province) aid matches local support to lower the price of education up to some limit. After the limit the aid is essentially a block grant. (Feldstein, 1978)

Categorical grants: These are grants given for special purposes on which the local community would have spent less than the allotted amount in the absence of the grant. (Ladd, 1975)

Differential add-on-grants: These grants require a local government to spend different amounts on two subgroups of a population, such as low income or immigrant families. (Feldstein, 1978)

Each of these grants involves a different level of monitoring and accountability. The last two grants are relatively easy to enforce since they require observed differences in spending.

Renshaw (1960) found that for government grants in general (i.e. no breakdown of any type) the elasticity of educational expenditure per student with respect to state aid was .378. Thus for every 10% increase in state aid, approximately 3.78% is used for educational expenditures. This indicates that there was a substitution effect, with the education grant serving to a large extent as tax relief. This elasticity was not found to be consistent across different regression equations. The elasticity varied from .16 to .51 depending on the specification of the model.

Both Ladd (1975) and Feldstein (1978) divided grants into their different types to ascertain the effectiveness of specific grants. Feldstein showed that state government block grants had an elasticity of 0.12 while in the case of federal aid for education the elasticity of expenditures on education with respect to aid was only 0.06. Ladd showed that state block grants had similar low elasticities .0301 which implied that given the mean level of expenditure, approximately half of each dollar increase was spent on education. For categorical grants, however, the elasticity was higher, 0.106. The difference in effectiveness is attributed to the nature of the grant. Categorical grants are granted for special purposes and not necessarily repeated each year.

The differential add-on grant was found by Feldstein (1978) to be more effective than the block grant with 72 cents out of every $1.00 spent on education. Feldstein concludes that this type of grant is an effective way of increasing educational spending. The above results are confirmed in the work of Craig and Inman (1982). They found that highly monitored and matching grant programs were more effective in increasing spending than non-monitored programs and lump sum grants.

This brief summary of empirical evidence suggests that there is a wide range of response by education authorities to grants-in-aid, depending on the nature of the grant.

2. The Determinants of Education Expenditures

A review of the empirical literature indicates that there are variables which are important in determining spending on education. These are income, property values, the price of education and tastes. The first three variables warrant further discussion since they are interrelated in many of the expenditure models used in recent years to examine education expenditure patterns. The models of Lovell (1978), Ladd (1975), Feldstein (1978) and Black, Lewis and Fink (1979) all assume utility maximization of the median voter. This means that the key income in determining spending is the median income. (Ladd, Feldstein) Lovell argues that the relevant income is the median/mean income since it is this skewness that will affect the spending of the median voter given that mean income generates the funds. Thus income is defined as a relative price term. Lovell does not include property values into the regression equation but again links them with the tax price facing the median voter.

Ladd uses the median/mean housing value in the tax-price term and average property value is entered separately as a wealth variable. Thus, whereas Feldstein defines wealth as the official equalized property value, other models use relative price in terms of income and property values.

The effective tax price used by Lovell and Ladd, can be further modified by disaggregating by type of property. The composition of residential and business assessment is important in determining a community's willingness to finance educational services. Ladd further divided the business sector into industrial and commercial zones and found that an increase in industrial land assessment would not increase expenditures as much as an increase in commercial assessment. This is probably due to the perceived cost to the voter of a possibly smaller future tax base given the mobility of industrial capital. Lovell divided the residential sector into owner occupied and rental components. He found, as did Ladd, that the mix was important in determining the tax-price perceived by the median voter. The total property base is therefore just one of the factors which influences the tax price.

All authors using the median voter hypothesis allowed for a matching rate in state aid. The effective price facing the voter is the product of the tax base and the matching component where the tax base is that perceived by the median voter.

The remainder of the pertinent variables are related to tastes as proxied by demographics variables. The importance of these variables varies from study to study depending upon the educational system analyzed and the time period covered by the data. Most researchers found that "years of education" was an important explanatory factor in determining per capita expenditure. (Reilly (1982), Lovell, Ladd, Feldstein (1978)) The logic appears to involve the connection between the consumption of education and the transfer of the value derived from it to the next generation. Other variables such as age, proportion of private/public schools, the growth rate of school age children, the percent of the population in poverty, to name a few, were also found to be important.

3. Transfers for Education and Wealth Neutrality

Most studies (Lovell, Ladd) employ property value as a measure of fiscal capacity while recognizing the shortcomings of doing so. Wealth neutrality requires a system of grants such that average wealth differentials across school districts have no bearing on per capita real education expenditures.

As noted above, per capita property values need to be modified to reflect the tax-price facing the median voter. The emphasis in Lovell's paper is that equalization of the total property base alone cannot completely equalize education spending. This agrees with Ladd's findings that equalization using indicies of property values placed low income communities at a disadvantage. A measure of per capita income is preferable to property values as a proxy for wealth.

Feldstein's model interprets wealth neutrality as a zero total elasticity of expenditure per student (E) with respect to wealth (W). Formally the reduced-form equation is

$$\ln E_i = \alpha_0 + \alpha_1 \ln W_i + u_i$$

where E_i is per pupil expenditure on education and W_i is per pupil property value assessment.

Wealth neutrality occurs when $\alpha_1 = 0$.

Through various manipulations of this basic equation, Feldstein shows the total wealth elasticity as a function of two behaviour parameters.

$$\alpha_1 = \beta_p \gamma_{pw} + \beta_w$$

where β_p is the elasticity of expenditure per student with respect to the matching rate component of the tax price, β_w is the elasticity of expenditure with respect to wealth. Finally γ_{pw} is the elasticity of the matching component of the tax price with respect to wealth.

When $\alpha_1 = 0$, then $\gamma_{pw} = \dfrac{\beta_w}{\beta_p}$

Feldstein recommends that programs should be implemented which satisfies the restriction for γ_{pw} under wealth neutrality. He goes on to state that an equalization of the tax base would imply $\gamma_{pw} = 1$. This case is wealth neutral only in the case of $\beta_w = \beta_p$. A scheme of this nature is likely to shift funds to low wealth municipalities with a negative wealth effect on education spending per student.

Black, Lewis, and Fink (1979) state that Feldstein's recommendations cannot be applied to areas where no current matching schemes exist hence β_p is unknown. They recommend using the adjusted tax base of their model (identical to Ladd's) as a proxy for β_p in policy decisions.

A study was done testing the effects of a guaranteed tax base (Reilly,

1982) in the State of Michigan. In this study the effect of property values on spending and tax decisions was insignificant for districts below the minimum required tax base. The property variable was still significant in the other districts. The formula was found not to reduce differences in tax rates on property assessment but rather to reduce differentials in local taxes as a percentage of income for those districts covered by the formula. This indicates that a substitution effect has occurred with local effect being replaced by government aid. Reilly found that the guaranteed tax base did neutralize the effect of property assessment differentials but as many researchers have suggested, this may not be the desired objective.

BIBLIOGRAPHY

Auld, D. Optimal Fiscal Balance, Centre for Federal Relations, Canberra, Australia.

Auld, D. Taxing Capital Through The Property Tax, A Report Prepared for the Economic Council of Canada, Ottawa.

Barzel, Y. "Two Propositions on the Optimum Level of Producing Collective Goods" Public Choice, Spring, 1969.

Bird, R. and E. Slack, Urban Public Finance in Canada, Butterworths, Toronto, 1983.

Black, D.E., K.A. Lewis and C.R. Link, "Wealth Neutrality and the Demand for Education", National Tax Journal, 32, 145-158, 1979.

Blaig, M., "Economic Aspects of Vouchers for Education" in Education: A Framework For Choice, Institute for Economic Affairs, London, 1967.

Craig, S.G. and R.P. Inman, " Federal and Public Education: An empirical look at the new fiscal federalism", The Review of Economics and Statistics, 65, 541-552, 1982.

Feldstein, M.S., " Wealth Neutrality and Local Choice in Public Education", American Economic Review, 65, 78-89, 1975.

Feldstein, M.S., "The Effect of a Differential Add-on Grant: Title 1 and Local Education Spending", The Journal of Human Resources, 13, 443-458, 1978.

Friedman, M., "The Role of Government in Education" in Economics and the Public Interest, ed. R. Solow, Rutgers University Press (1955).

Katzman, M., "Pricing Primary and Secondary Education", in Public Prices for Public Products, The Urban Institute, Washington, 1972.

Ladd, H.F., "Local Education Expenditures, Fiscal Capacity and the Composition of the Property Tax Base", National Tax Journal, 28, 145-158, 1975.

LaNoue, G. (ed) Educational Vouchers: Concepts and Controversies, Teachers College Press, Columbia University, 1972.

Lovell, M.C., "Spending for Education: The Exercise of Public Choice", The Review of Economics and Statistics, 60, 487-495, 1978.

Maynard, A., Experiment with Choice in Education, Institute for Economic Analysis, London, 1975, Hobart Paper 64.

Nova Scotia, Report of the Royal Commission on Education, Public Service and Provincial Municipal Relations, Halifax, N.B., 1974.

Oates, W., Fiscal Federalism, Harcourt Brace Jovanovich, N.Y. 1972.

Ontario Ministry of Education, Euqlity of Education Opportunity and Equalization of the Mill Rate Burden, Toronto, 1984.

Peacock, A. and J. Wiseman, Education for Democrats, Institute for Economic Affairs, Hobart Paper 25, London, 1964.

Reilly, G.J., "Wealth Neutrality Revisited: Guaranteed Tax Base Formulas and Local Choice in Public Education", Review of Economcs and Statistics, 65, 553-561, 1982.

Reischauer, R. and R. Hartman, Reforming School Finance, Brookings Institution, Washington, 1973.

Renshaw, E.F., "A Note on the Expenditure Effect of State Aid to Education", Journal of Political Economy, 68, 170-174.

Serrano vs Priest, Harvard Education Review, Nov. 1971, 41, p.503.

Tulloch, G., "Social Cost and Government Action", American Economic Review, May 1969.

Vaizey, J., The Economics of Education, Faber and Faber, London, 1962.

Wiesbrod, B., External Benefits of Public Education, Princeton, 1964.

Ziderman, A., "The Economics of Educational Policy", in Current Issues in Economic Policy, ed. R.M. Grant and G.K. Shaw, Philip Alan Publishers, 1975.

WEALTH AND TAX BASE NEUTRALITY AND THE FINANCING OF EDUCATION IN ONTARIO

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Wealth and Tax Base Neutrality and the Financing of Education in Ontario

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During the past decade, several important studies have been made to investigate the pattern of school expenditure in various school districts of the United States. (Lovell, 1978; Feldstein, 1975; Black, et al, 1979; Ladd, 1975; Reilly, 1982; Wentzler, 1980; Inman, 1982) No analysis of this kind has, to our knowledge, been undertaken for Ontario which is surprising in light of the ongoing controversy over school funding and the important role this public expenditure plays in the development of human capital. In addition to issues involving economic efficiency there is, what many would argue, the more important question, the issue of equity.

Primary and secondary school expenditure in Ontario is financed by a combination of grants from the provincial government and monies raised locally by taxing both residential and non-residential assessment in the local school board district. Such a board `district´ may contain a single city, a collection of towns and rural counties or a city along with smaller communities and rural areas in a single county. It is obvious that the per pupil levels of assessment and income, the mix of property assessment and pattern of need are going to vary across school boards. To require school boards to be entirely responsible for raising monies to finance education would result in either very different levels in the quality of education or widely dispersed tax burdens given the per capita assessment and income differentials across municipalities in Ontario.(1)

This has long been recognized and over the years, a complex set of provincial grants has evolved in an attempt to provide school boards with per pupil funding levels to ensure the possibility of reasonably similar qualities of education throughout the province without requiring any one school board or sub-set of boards to impose undue high tax rates to achieve a specific standard of quality.(2)

At the heart of the recent analysis in the United States is the concept of `wealth neutrality'.(3) Wealth neutrality implies that if there is a difference in per pupil expenditure on education, such differences should be the result of the wishes of the electorate in the board district and <u>not</u> due to differences in local tax bases or per pupil assessment. Given that assessment has, in general, been viewed with suspicion as a good indicator of wealth, the concept of wealth neutrality can be extended to include per pupil income. Lovell (1978) in his study of Connecticut, concluded that "... median income is more important than the per student property tax base in explaining educational expenditure..." (p. 488). What wealth neutrality means statistically is that we should observe no relationship between expenditure and wealth in a regression of per pupil expenditure on per pupil wealth, however defined. More will be said about this later.

It should be emphasized that the concept of wealth neutrality in its strictest interpretation does not involve any provincial or state minimum or maximum quality of education. Higher levels of government merely provide funds to offset differences in wealth between school boards and then allow school boards to decide on how much they should spend on education. It is conceivable that a school board might levy no local taxes and finance education entirely from the grant it receives from the provincial government. A province could (Ontario does) require that a minimum tax rate be applied and `ties´ this with a per pupil level of expenditure thereby explicitly establishing a floor for per pupil education expenditure. This might be appropriately referred to as `bounded wealth neutrality´.

While wealth differentials may clearly influence local boards´ decisions on expenditure for education, the mix of assessment may be even more important.(4) Consider two school board districts, A and B where in A the residential assessment is 30% of the total and the commercial/industrial assessment is 70%. In board district B, the reverse is the case but in both districts, the per pupil assessment is the same. This suggests that any provincial grant will be the same for both districts. It has been argued, however, that is is much easier for board A to raise taxes for education than it is for B to do so because of the differences in tax exporting. Empirical studies point to the fact that industrial/commercial taxation can, in certain circumstances, be exported from the community where the taxes are imposed through increased product prices. Residential taxes cannot be exported. Thus, it is ratepayers´ associations which will oppose higher taxation and in communities with a high proportion of residential assessment, it is more difficult to obtain funds for education. We can therefore think of the possibility of there being a violation of "assessment-mix neutrality" where per pupil expenditures are consistently higher in board districts where the ratio of non-residential to total assessment is high.

Our statistical analysis of primary and secondary education expenditure in Ontario was stimulated in large part by the fact that little is known about possible significant and consistent violations of wealth and mix neutrality in the province. Ideally, we had hoped to examine per pupil expenditure behaviour in the period before the grant formula charged in 1979 and then in the later period. Unfortunately, county data on the mix of assessment was not available for the earlier period and we have therefore confined ourselves to a pooled, cross section analysis of 30 school board districts during the 1980-82 period.(5) The basic regression equations tested took the form

$$E_t^{ij} = \alpha_0 + \beta_0^k[X_t^i] \quad \text{and} \qquad (1)$$

$$\ln E_t^{ij} = \alpha_1 + \beta_1^k[\ln X_t^i] \qquad (2)$$

where E_t^{ij} = per pupil expenditure on primary education (j=1) or secondary education (j=2) in the ith school board in year t.

X_t^i = characteristics of the ith school board district are hypothesized to influence the level of Y_t^{ij}.

The characteristics chosen and the reasons for their selection are as follows.

1. Per pupil total assessment (ASES). This variable is the broad tax base for the school board. If there is complete wealth neutrality with respect to this proxy for wealth, then a regression of Y_t^{ij} on $ASES_t^i$ should result in $\beta^W = 0$.

2. Per pupil income (INC) (from tax files). This data was supplied by Revenue Canada on a county basis, then aggregated where necessary to provide total income reported in each school board district. This variable, by itself or included along with ASES, can be used to test for wealth neutrality. Complete wealth neutrality would be signified by $\beta^I = 0$.
3. Per pupil provincial grants (GR). These grants constitute a large share of total financing for school boards and must therefore be included as a determinant of local expenditure on education. The coefficient, β^G will provide some idea of the expenditures response by school boards to provincial grants.
4. The ratio of non-residential to total assessment (MIX). As explained earlier, the mix of assessment may produce systematic differences in expenditure due to the relative ease of raising tax rates on non-residential property.

Econometric Results

Primary Education

Tables 1 and 3 provide the parameter estimates and basic characteristics of the equation for per pupil expenditure (EP) on primary education in 29 school board districts (SBD). Equation results in Table 1 are based on simple OLS linear equations while in Table 2, log-linear results are shown. The latter provide estimates of elasticities of per pupil expenditure and the various regressors.

The basic `test´ of wealth neutrality is the relationship between EP and measures of wealth as proxied here by per pupil assessment (ASES) and per pupil reported personal income (INC). Equation 7 in Table 1 suggests that both variables are important in determining EP, accounting for over two-thirds of the explanation of the variance in EP. However, if these two variables are used by themselves (Equations 1 and 2), it is clear that income is by far the most important explanatory variable, accounting for over 60 percent of the variance in EP. It is also highly significant. Assessment does nevertheless, contribute to the overall explanatory power of the equation.

If we turn to the log linear estimations, a very similar pattern emerges with INC the dominant wealth variable with an elasticity estimate of 0.35 indicating that a 10 percent increase in per pupil income leads to a 3.5 percent increase in expenditure per pupil. The assessment elasticity is also significant, with a value of 0.22. Together these two variables in the log linear form, account for over half the variance in EP.

These results suggest that expenditure on primary education in Ontario is not wealth neutral; indeed, wealth has a significant (statistically) and important (in terms of elasticities) impact on expenditure in SBDs. However, the low correlation associated with ASES and its smaller and less significant coefficient clearly indicates that provincial grants have gone a considerable distance to reduce the effect of property wealth on education spending.

Does the assessment mix influence per pupil expenditure? The mix variable (MIX), the ratio of non-residential to total assessment, was added to each of the wealth variables and the results are shown in equations 3 and 4 of Tables 1 and 3. When incorporated along with INC, it raises the explanatory power slightly but is negative in sign. When incorporated with

ASES, the explanatory power is greatly enhanced and it is positive in sign. In the log linear form, (see equations 3 and 4 in Table 3) the results are similar.

Part of the explanation is the high degree of multicollinearity in equation 3. The correlation coefficient for INC and MIX is 0.781 and 0.731 which likely contributes to an overestimation of the true standard error of MIX. There may also be spurious correlation. Assessment and mix are not higly correlated leading us to conclude that the higher the non-residential to total assessment ratio, the tendency to spend more on primary evaluation on a per pupil basis.

When provincial grants per pupil are incorporated along with the wealth variables, there is slight improvement in the explanatory power of the equation (equation 8). In the log linear format, the elasticities on INC and ASES are virtually unchanged and the grant variable (GR) is statistically insignificant.

When all four variables are included in the regression, (equation 9 in Tables 1 and 3), there are similarities between the linear and log linear forms. In the case of the linear equation, the coefficients on INC and ASES are increased and reduced respectively when compared to equation 8, Table 1. The mix coefficient is marginally significant but negative, since income is indulged. This is also the case in the log linear format. The elasticities associated with INC and ASES increase and decrease respectively (when compared to equation 8) with the grant coefficient being statistically insignificant. In the case of (MIX) the negative coefficient may be due to the inclusion of INC and MIX in the same equation. The explanatory power of the regression is not enhanced.

In conclusion, it seems fairly clear that as far as primary education is concerned, the Ontario "system" is not wealth neutral especially with reference to income. Furthermore there is at least tentative evidence that the mix of assessment influences per pupil expenditure in a manner hypothesized earlier. When the equations are run with all variables except income, MIX is positive and highly significant.

Secondary Education

Tables 2 and 4 provide the regression results for secondary school financing. Equation 7 in the two tables indicates that the wealth variables do not explain as much of the variance in per pupil secondary expenditure (ES) as they did in the equations for primary education expenditure. Assessment per pupil (ASES) is statistically insignificant in both equations indicating that when considered along with income, ES is wealth neutral. If however, assessment alone is the explanatory variable, the coefficient is significant. Given that the $\bar{R}^2$ is low (.06 and .08) and the elasticity in the log linear equation is small (.11), whatever non-neutrality exists is small. Per pupil income (INC) is not only highly significant but even alone, accounts for one third of the variance in ES.

When assessment mix (MIX) is included along with INC, the results observed for the primary education equations emerge; the coefficient is not significantly different from zero. When MIX is included along with ASES, the coefficient on MIX is statistically significant and clearly adds to the equation ls explanatory power. Equation 4 in Table 4 indicates that for every 10 percent increase in the ratio of non-residential to residential assessment, there is a corresponding ,5 percent rise in per pupil expenditures at the secondary level. Since the mean value of MIX is 0.40 and the SD is 0.16, this effect is not trivial.

Equation 8 adds the provincial grant variable (GR) to the two wealth variables. The coefficient is significant statistically but the inclusion of GR increases the value of $\bar{R}^2$ only from 0.34 to 0.37 in the log-linear equation and from 0.34 to 0.39 in the linear version. The value of the coefficient is not different from some U.S. results (Renshaw, 1970). The elasticity is 0.10 indicating that a 10 percent increase in grants per pupil at the secondary level leads to a 1.0 percent rise in per pupil expenditure.

Equation 9 incorporates all four variables. All are significant and the value of the $\bar{R}^2$ reaches .47 in the linear model and .38 in the log linear one. The elasticities tend to "jump around" a little with the coefficient on ASES in Table 4 more than doubling while that associated with INC declining from 0.29 to 0.23. There is a corresponding rise in the elasticity of the grant variables.

When all variables except income are used in the equation (10) mix is highly significant as are the other variables.

In conclusion, while secondary education appears to be close to wealth neutral in terms of assessment, this is clearly not the case for income. As for assessment mix neutrality, the results suggest a stronger case for non-neutrality can be made for secondary school expenditure than for primary school expenditure. Finally, the elasticity of grants with respect to expenditure is clearly significant, indicating a greater sensitivity at the secondary financing level to provincial grants.

TABLE 1

Per Pupil Expenditure on Primary Education: Simple Linear Equation

Equation	Constant	GR	INC	ASES	MIX	$\bar{R}^2$	SER
1	1214.7		7.85			.65	1.59
	(21.09)		(12.74)				
2	1562.5			1740.4		.15	2.48
	(17.09)			(4.04)			
3	1253.0		10.44		-853.7	.70	1.47
	(23.10)		(11.90)		(3.88)		
4	1108.9			2006.4	1265.9	.41	2.06
	(10.59)			(5.57)	(6.28)		
5	1720.9	-0.15			1059.6	.21	2.39
	(11.11)	(1.21)			(4.41)		
6	1558.5				1133.6	.21	2.40
	(20.13)				(4.86)		
7	1049.4		7.35	1034.2		.70	1.47
	(15.52)		(12.63)	(3.96)			
8	733.4	.22	7.78	1356.4		.73	1.41
	(5.56)	(2.75)	(13.34)	(4.89)			
9	844.4	0.18	9.21	1062.4	-457.2	.73	1.39
	(5.93)	(2.27)	(9.80)	(3.39)	(1.19)		
10	789.9	.21		2371.4	1394	.43	2.04
	(3.83)	(1.72)		(5.72)	(6.55)		

NOTE: (t scores are in the brackets below parameter estimates)

TABLE 2

Per Pupil Expenditures on Secondary Education:
Simple Linear Equations:

Equation	Constant	GR	INC	ASES	MIX	$\bar{R}^2$	SER
1	1946		5.77			.33	2.59
	(16.85)		(6.68)				
2	2471.1			656.7		.06	3.07
	(26.24)			(2.59)			
3	1912.0		5.48		264.0	.33	2.59
	(15.34)		(5.58)		(.83)		
4	1888.7			1096.3	1360.7	.25	2.75
	(12.61)			(4.47)	(4.70)		
5	2438.5	0.01			958.9	.06	3.08
	(11.72)	(.06)			(2.68)		
6	2426.3				962.7	.07	3.06
	(23.13)				(2.75)		
7	1907.4		5.47	232.4		.34	2.58
	(15.55)		(6.02)	(1.03)			
8	1227.2	.33	6.06	606.6		.39	2.47
	(4.73)	(2.93)	(6.78)	(2.42)			
9	499.5	.54	4.09	1417.2	1460.0	.47	2.30
	(1.61)	(4.54)	(4.18)	(4.48)	(3.77)		
10	529.4	.57		2016.4	2319.2	.37	2.52
	(1.57)	(4.42)		(6.54)	(6.47)		

TABLE 3

Per Pupil Expenditure on Primary Education: Log-Linear Equations

Equation	Constant	GR	INC	ASES	MIX	$\bar{R}^2$	SER
1	5.9 (41.1)		.35 (10.8)			.57	.08
2	7.9 (7.91)			.22 (4.36)		.16	.12
3	5.3 (25.09)		.46 (11.09)		-.10 (3.89)	.63	.08
4	8.2 (91.09)			.27 (5.76)	.14 (5.09)	.35	.11
5	8.3 (31.92)	-.09 (2.34)			.10 (3.39)	.15	.12
6	7.7 (189.2)				.10 (3.43)	.11	.12
7	6.3 (38.89)		.32 (10.43)	.13 (3.79)		.63	.08
8	6.3 (24.91)	.01 (.31)	.33 (10.27)	.13 (3.65)		.63	.08
9	5.7 (16.59)	.01 (.29)	.41 (8.4)	.09 (2.11)	-.07 (2.27)	.64	.07
10	8.2 (36.1)	-.01 (.40)		.26 (5.09)	.13 (4.96)	.35	.11

TABLE 4

Per Pupil Expenditure on Secondary Education: Log-Linear Equations

Equation	Constant	GR	INC	ASES	MIX	$\bar{R}^2$	SER
1	6.4 (30.13)		.30 (6.81)			.34	.09
2	8.0 (178.6)			.11 (2.88)		.08	.11
3	6.4 (27.41)		.29 (6.41)		.01 (.28)	.33	.09
4	8.2 (114.7)			.18 (4.39)	.10 (3.71)	.20	.10
5	8.3 (20.87)	-.05 (.83)			.05 (1.81)	.02	0.11
6	7.9 (196.0)				.05 (1.83)	.03	.12
7	6.5 (25.53)		.28 (5.91)	.01 (.61)		.34	.10
8	5.7 (11.96)	.11 (2.00)	.29 (6.21)	.06 (1.60)		.37	.09
9	5.8 (12.27)	.15 (2.59)	.23 (4.11)	.14 (2.45)	.06 (1.84)	.38	.09
10	7.05 (16.91)	.18 (2.88)		.28 (5.32)	.14 (4.69)	.26	.10

Summary and Conclusion

If the goal of the Government of Ontario is to provide grants to school boards to ensure that per pupil expenditure on education does not depend on wealth, then the current system succeeds only in part. While there a positive and significant relationship between per pupil expenditure and per pupil assessment, the strength of the relationship suggests limited non-neutrality. However, there is a strong relationship between per pupil expenditure and per pupil personal income which many would argue is a preferred measure of wealth.

This is not a complete surprise. The present grant system is not substantially different from U.S. schemes such as `Percentage Equalization', `District Power Equalization', or `Guaranteed Tax Base'. These all guarantee school districts the same tax base per pupil (ASES*) such that if a district levies a tax rate t on its equalized base (ASES) its revenue will always be t.ASES*. The grant to a district (G) is thus

$$G = t.ASES^* - t.ASES$$

With a limit on what can be spent for grant purposes, ($E^* = t^*.ASES^*$) not only is it easier for districts with a tax base above ASES* to generate more local revenue but some districts below ASES* may not receive any matching grants. In Ontario, both the recognized per pupil expenditure and equalized mill rate are provincial fiscal instruments. As Feldstein (1975) has pointed out, the province "...can neutralize the effect of inter-community wealth differences by using a matching grant formula in which the rate of matching varies inversely with local wealth".(p.77) The Ontario formula does not do this.

The third important finding is the tendency for non-neutrality with respect to the assessment mix. The higher the ratio of non-residential to residential assessment, the higher the per pupil expenditure on education. While the magnitude of the effect is small compared to the non-neutrality of wealth, it clearly adds to the bias of the system. This result confirms for Ontario the results achieved by Ladd (1975) in Massachusetts.

In conclusion, this preliminary statistical analysis suggests that there is indeed need to reform the system of financing primary and secondary education in Ontario. Notwithstanding the current grant scheme and other special grants, pupils attending schools in lower income/assessment districts where residential assessment is relatively high are at a disadvantage. If equal education opportunity is to be guaranteed with similar tax burdens across the province, a new grant formula, incorporating differences in assessment mix and income is required. Alternatively, the Province could remove the school boards' power to tax non-residential assessment and tax it Province-wide, channeling the proceeds back to school boards on a per pupil basis.

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Footnotes

1. Per pupil income in the wealthiest of the 29 school board districts in the study was 74% higher than in the lowest income SBD. In the case of assessment per pupil, a similar magnitude of difference between the richest and poorest school board district prevails.

2. The current scheme, known as the mill rate equalization plan (MREP), which is based on the understanding that all school board with the same mill rate on their equalized assessment have the same financial revenues per pupil through property tax revenue and grants. The scheme is bound however, by a "recognized per puil level of expenditure" set by the province. The formula is

$$G_j = N.E - \bar{r}^e.A^e_j$$

where G_j = the grant to school board j
N = the number of pupils
E = the per pupil recognized expenditure
$\bar{r}^e$ = the equalized mill rate
A^e_j = equalized assessment in school board district j

3. The term is generally credited to Feldstein (1975). It is a form of what might be termed categorical equity which could refer to a collective decision not to allow differences in per capita (or per pupil) expenditures for certain public goods <u>or</u>, not to allow differences to depend on income. The latter Feldstein refers to as wealth neutrality.

4. It has long been recognized that the degree to which residents perceive non-residential taxes to be exported will influence their `perceived´ tax for local expenditure (Ladd, 1975). From the politician's viewpoint it is therefore less difficult to impose additional taxes on commercial/industrial assessment than residential assessment. This belief has led to Ontario proposing to remove non-residential assessment from the local tax base (Ontario Ministry of Education, Ontario 1984) and to a British Columbia Commission on school finance doing the same (Ministry of Education, British Columbia 1981).

5. While metropolitan Toronto is included, several two-tiered jurisdictions are omitted from the data set. Hopefully this can be remedied once the income tax data can be matched with municipal boundaries. The 30 school board districts do account for approximately 2/3 of total enrolment.

Bibliography

Black, D., K.Lewis and Charles Link, "Wealth Neutrality and the Demand for Education," *National Tax Journal*, V.32, 1979, p. 157-64.

Craig, S. and R. Inman, "Federal Aid and Public Education: An Empirical Look at the New Federalism," *The Review of Economics and Statistics*, V.64, Nov. 1982, p. 541-551.

Feldstein, M., "The Effect of A Differential Add-On Grant: Title I and Local Education Spending," *The Journal of Human Resources*, V.13, No.4, p. 443-58.

Feldstein, M., "Wealth Neutrality and Local Choice in Public Education," *American Economic Review*, Mar. 1975.

Ladd, Helen, "Local Education Expenditures, Fiscal Capacity, and the Composition of the Property Tax Base," *National Tax Journal*, V.28, No.2, June 1975, p. 145-158.

Lovell, M., "Spending for Education: The Exercise of Public Choice," *The Review of Economics and Statistics*, V.60, Nov. 1978, p. 487-95.

Ministry of Education, Province of British Columbia, *School Taxation Report*, 1981, Victoria, B.C.

Ontario Ministry of Education, *Equality of Education Opportunity and Equalization of the Mill Rate Burden*, Toronto, 1984.

Renshaw, E., "A Note on the Expenditure Effect of State Aid to Education," *Journal of Policital Economy*, Apr. 1970, p. 170-74.

Reilly, G., "Guaranteed Tax Base Formulas in School Finance: Why Equalization Doesn't Work," *Journal of Education Finance*, V.7, Winter 1982, p. 336-47.

Reilly, G., "Wealth Neutrality Revisited: Guaranteed Tax Base Formulas and Local Choice in Public Education," *The Review of Economics and Statistics*, V.64, Nov. 1982, p. 553-61.

Slack, E., "Local Fiscal Response to Intergovernmental Transfers," *Review of Economics and Statistics*, Aug 1980, p. 364-70.

Wentzler, N., "Wealth Neutrality and the Demand for Education: A Comment," *National Tax Journal*, V.33, 1980, p. 237-38.

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**COMMISSION ON THE FINANCING OF
ELEMENTARY AND SECONDARY
EDUCATION IN ONTARIO**

COST ELEMENTS AND POTENTIAL STRATEGIES FOR THE APPLICATION OF NEW INFORMATION TECHNOLOGIES TO ELEMENTARY AND SECONDARY EDUCATION IN ONTARIO

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COMMISSION ON THE FINANCING OF ELEMENTARY AND SECONDARY EDUCATION IN ONTARIO

TABLE OF CONTENTS

Page No.

I. INTRODUCTION 207

II. PERCEIVED BENEFITS OF AND ISSUES FACING NIT 209

A. BENEFITS CLAIMED FOR NIT 210
B. KEY ISSUES FACING NIT 216

III. CLASSIC COST/BENEFIT MODEL FOR TECHNOLOGIES 227

IV. COST ELEMENTS OF NIT 231

A. EDUCATIONAL SOFTWARE 232
B. HARDWARE 234
C. TRANSMISSION 235
D. TRAINING 236
E. MANAGEMENT/OVERHEAD 238

V. THE COST BENEFIT DILEMMA 239

VI. POTENTIAL STRATEGIES 242

A. DEVELOP A FOCUSSED SOFTWARE STRATEGY 242
B. REVIEW THE HARDWARE STRATEGY 243
C. FORMULATE A COMPREHENSIVE TEACHER TRAINING PROGRAM 244
D. CREATE A PILOT "WIRED" SCHOOL 245
E. ASSESS THE MERITS OF CREATING AN ONTARIO EDUCATIONAL COMPUTER CONSORTIUM 245
F. INITIATE DISCUSSIONS WITH OTHER PROVINCES 246
G. CONDUCT A STUDY INTO THE TELECOMMUNICATIONS NETWORK 246
H. ESTABLISH A LIAISON MECHANISM FOR THE VARIOUS INTEREST GROUPS 247
I. REVIEW THE ORGANIZATIONAL ARRANGEMENTS 247
J. DEVELOP A COMPREHENSIVE PLAN AND MONITORING MECHANISM 248

VII. CONCLUSION 249

LIST OF APPENDICES

I. SCHEDULE OF PERSONNEL INTERVIEWED

II. SCHEDULE OF MATERIAL REVIEWED

I. INTRODUCTION

The substantive impact of the computer is evident in many facets of our life today. The subject appears daily in every form of media, and projections of its potential impact abound. With respect to the field of education, a new term has emerged. This is New Information Technology (NIT) which encompasses a number of technological advances. It is differentiated from the "old" technologies which were various forms of audio/visual and audio/oral teaching aids. The most notable of these has been educational television programming.

What distinguishes NIT is the interactive nature of the new technology. That is, the former technologies were one-way communications which, at best, permitted the student to control the pace and repetition of the material. With NIT, interaction between the student and the material, supported by computer logic, is possible, which leads to a much broader range of applications. Perhaps the first of the NIT's was the interactive terminal connected to a mainframe computer. This began to emerge in the early 1970s. In Ontario, OISE was the pioneer in this field and remains so today. Subsequently, microcomputers became popular and prevalent in schools from Junior Kindergarten to Grade 13.

The most recent technological developments are interactive video disks and telecommunications networks. Interactive video disks combine the power of a video disk player (similar to a VCR) with the power of a computer, generally a microcomputer. This permits visual images to interact with, and be controlled by, computer logic, thus providing a particularly rich program content. Telecommunications operate at two levels, local and distant. Local area networks are designed to tie microcomputers and their associated peripherals together to multiply their power and to broaden access to material. Traditional distant telecommunications are improving rapidly through land-based and satellite networks.

NIT applications (software) now range from simple mathematics tutorials and drills to complex simulations in history and social sciences. Software is being developed, for example, to teach much of the content of English grammar. Other programs allow students to recreate and interact with important historical events. High quality computer graphics and films are interspersed with narratives to enrich the content of the lesson.

These, then, are the new information technologies which offer considerable potential for changing the entire structure and content of education.

This research project was launched by the Commission as it recognized that, as in other sectors of our society, technology could have a significant impact on education. Indeed, at a time of continuing escalation in education costs in the face of declining enrolments, the intelligent application of this technology may represent one of the few meaningful opportunities for containing the costs while maintaining, or even enhancing, the calibre of education. Sufficient experience has now been gained in other sectors of society to demonstrate that this may, in fact, be possible. In certain sectors, computers and related technologies are so integral to their operation that it would be unthinkable to return to a largely manual structure. Yet education remains today much as it was generations ago - a largely manually intensive process.

This project has been conducted through a combination of interviews, desk research, data gathering and the application of the personal experience of the author gained through more than 20 years of work in the computer field. Those interviewed are listed in Appendix I while a list of reference material is contained in Appendix II. The study was constrained by the practical limitations of budget which permitted only three man-weeks of time to be dedicated to the subject. Nevertheless, over a dozen leading thinkers and participants in this field in Ontario today were interviewed and dozens of papers and documents were reviewed. This has permitted a reasonably comprehensive assessment of the subject matter. The primary purpose of the report is to provide a framework to guide the thinking of the Commission members so that they may give due recognition in their deliberations to the potential impact of NIT.

This report begins with a brief description of NIT's perceived benefits for education, and the principal issues still to be addressed and resolved. The next section sets out the classic approach that would be followed in industry to deal with technology and manage its implementation. The potential application of this model to NIT in education is then described. The next section deals directly with the financing implications, both one-time and ongoing. The final section describes potential strategies which Ontario may consider for proceeding with NIT.

It should be noted that the scope of this project did not permit an assessment of what the government is doing now in this area, and how effective those programs are. While the author is generally familiar with government programs, an assessment was not called for or conducted.

II. PERCEIVED BENEFITS OF AND ISSUES FACING NIT

This field is obviously new and only limited hard evidence is, as yet, available to confirm the value or fully understand all the implications of NIT. Many benefits are claimed and many important issues are recognized as being outstanding. In many respects, the field is being carried along by enthusiasm, faith and the type of structured and unstructured research often associated with the field of education. Each of the benefits cited in the following sections can be refuted by one or more individuals, and varying amounts of research are being marshalled for and against, depending upon the strength of the views held by the researchers and their particular perspective on the subject.

There is, however, general agreement on the outstanding issues. People in the field would agree that each issue is important and there are, as yet, no definitive answers. With these general provisions, then, one can define the principal benefits of and issues facing NIT.

A. BENEFITS CLAIMED FOR NIT

As noted earlier, NIT is perceived to be capable of changing the fundamental structure and content of education as we know it today. Apparently, the goal of universal education has been pursued, for all practical purposes, only in this century, and some date it from the end of the First World War. NIT is seen to be the vehicle by which this goal of universal education may indeed be practicable. Within that broad context, the following benefits are claimed.

1. The Teacher as Facilitator

The role of a teacher obviously varies according to subject matter and grade within the educational system. Nevertheless, it is generally conceded that the teacher spends a considerable amount of time in simply communicating information to the students. NIT permits much of these data to be made available through a more powerful medium than a textbook. This is due to the interactive nature of the medium and the logic power of the computer to establish a pace. Thus, the teacher is able to dedicate his/her time to the "nobler" tasks of education, devoting a higher percentage of time to a facilitator role than to an information transmission role.

2. Student-centred Learning

Learning today is often characterized as teacher-centred - that is, the teacher sets the pace and very much controls the process. The practical realities of class size, logistics and administrative management give rise to an institutionalized process. The concept of student-centred is that the student takes over a greater degree, although certainly not all, of the responsibility for directing his/her learning process. Thus the student, in theory, is able to better direct the pace at which he/she learns, and can vary the content. This compares with the traditional teaching "to the middle of the class", with limited potential for dealing with the slow and gifted children, or the more expensive and, perhaps, socially disruptive methods of grouping the gifted and slow-learners in classes by themselves, with specially designed programs.

3. Cross Educational Training

Subjects today tend to be well defined such as history, geography, reading, etc. In science and mathematics, students often proceed at different rates although one is fundamental to success in the other. The benefit claimed here for NIT is that cross educational teaching is greatly facilitated in that software can be developed to teach history, geography and reading, all in the same program, and the stereo-typed boundaries which have evolved to facilitate mass education may now be relaxed. In doing so, it is held that overall comprehension and learning are enhanced.

4. Learning for the Disabled and Functionally Illiterate

Much interesting research is being directed to the use of NIT for these individuals. For the disabled, different input/output mechanisms are being designed, depending upon the nature of the disability, to allow those individuals access to the power of the technology. It also allows a greater amount of educational material to be accessed by the individual who can then pace himself/herself, consistent with the nature and stage of coping with a particular disability.

Functionally illiterate individuals are considered a group with different needs than slow-learners. Again, software has been developed which permits these individuals to get the kind of continuous practice and attention which, when supplemented with teacher contact, can greatly expedite their learning process over traditional methods at, it is hoped, a more reasonable cost.

5. Distance Education

Many remote communities are unable to maintain adequate or current educational facilities, except at prohibitive cost. It is held that NIT provides these remote and often smaller boards with equal access to learning materials. There is also the potential to permit direct contact between students and leading educators, regardless of location. For example, many communities now have interactive teleconferencing capabilities between their hospitals and leading teaching hospitals in major urban centers. This permits a doctor in a remote community to conduct a diagnosis, transmit the results to technological facilities in the urban centers and discuss his diagnosis with a leading professional in the field. In a similar vein, it is envisioned that, in the future, teleconferencing capabilities will permit teachers and students to interact with leading educators. This is a step beyond the current stage of televising lectures from leading professionals, as it introduces the concept of interaction.

Another aspect of distance education is learning at home. Some of this now takes place through educational television networks such as TVOntario, but the concept of NIT goes further. With the technology available today, an individual can, with a home computer possibly attached to a television set, work through much of the educational software that might otherwise be taken in a school setting. This software could be either in the form of diskettes, as is the case of most microcomputer programs, or in the form of "downloading" through a modem from the local school board's or the province's central data bank of educational software.

6. Access to Educational Materials

Related to the issue of distance in education is the subject of data banks. The overwhelming percentage of current educational materials is in the form of print media. By its nature, print media is neither interactive nor necessarily up-to-date. Textbooks are also relatively expensive and have defined boundaries until a new textbook is written. Electronic storage and transmission of material, coupled with the logic power of the computer, offers the potential to greatly expand the accessibility of learning materials. Thus, instead of the students having access to a limited number of textbooks during the course of the year, supplemented by materials from the school or public libraries, the teacher and student could have access, literally instantaneously, to a wide variety of materials on a given subject area. In the case of a subject on which there are differing opinions, the proper organization of the data banks would allow these to be accessed and discussed much more readily than would be the case in having to assemble a considerable number of printed media sources.

7. Diagnosis of Learning Difficulties

Programs exist, and a growing body of research is being developed, to support the use of the computer to monitor the effectiveness of the learning process of the student. The computer has long been used in industry to monitor the effectiveness of the individuals who are using it. Thus, check-out clerks' and keypunch operators' throughput effectiveness and error rates and types are analyzed to develop improved training methods.

Similarly, the computer can track the length of time it takes students to respond to questions, the accuracy of response and the level of difficulty of subject matter being reviewed. It can also build up a historical data bank on these factors for each student. As a result, it is maintained that NIT can greatly facilitate the early detection of learning difficulties and the diagnosis of the type of difficulty. These can then be brought to the attention of the educator who can help customize learning programs, in part through the technology and in part on a one-on-one basis.

8. Enhancement of Pupil Interest

Some studies are beginning to emerge which indicate that the student's interest in attending school is actually enhanced through the use of NIT. It is easy to speculate that this may be due to the student-centred aspect, the novelty of the technology, its similarity with video games and micro computer games, the creativity of the educational software, etc. It is too early to tell whether this has a socio-economic bias, or even whether it is true. Nevertheless, it is being cited as one of the benefits in support of NIT's broader application.

9. Professional/Administrative Support

Some aspects of the new information technologies have already been applied to improving the administrative efficiency of the school system. Common applications are classroom scheduling, student records, budgetary and financial reporting, student guidance information data banks, school bus routing systems, etc.

Other examples, however, include test marking and the overall management of the education process. In terms of marking, a study was completed recently by the Independent Learning Centre of the Ministry of Education on the use of computers to mark correspondence courses. The study compared results from teacher marking, computer marking with no feedback other than right or wrong, and computer marking with prescriptive feedback which indicated possible reasons for the wrong answer and some repeat of the learning material in support of the right answer. It demonstrated that computer scoring with prescriptive feedback was far less expensive, yet equally as effective as teacher marking.

With respect to the management of the teaching function, NIT has the potential to facilitate the role of the principal, the teacher and the student. In addition to diagnosing learning difficulties, the computer can be far more powerful in the role of tracking the student's status in terms of his/her learning process across a wide variety of subject areas. It is also capable of helping to profile the student against available learning materials and, thus, help to organize a more dynamic teaching program.

It also could assist the principals in the schools to obtain better information on progress within the classrooms and on the work of the teachers. This "management information reporting" aspect has long been an accepted part of industry and government management, and has moved progressively in recent years into other helping professions. These include social work and nursing, as well as numerous other aspects of the social services and health care fields. Much has been learned in those areas on how to use the computer to improve the management of the professional function, without damaging or dehumanizing the process at the expense of the client.

Research is needed to develop an appropriate MIS for teacher/principal and teacher/consultant use, in an NIT environment.

10. The Emergence of Support Tools

Teachers have long supplemented formal teaching materials with their own ideas and material. This ranges from Gestetner copies of mathematics drills to complex field trips. Now, authoring languages have been developed which permit the teachers to, in effect, design their own programs to reinforce a particular subject area. These languages are relatively easy to use and, in time, could be as basic to teacher training as the organization and conduct of field trips. This will permit the teacher to exercise a greater degree of control and direction over the learning process than would be the case with totally manual or totally automated learning.

11. Reduction of Teaching Time

This is the most commonly cited and most frequently researched benefit of NIT. Studies have been done which show anywhere from a 20% to 50% reduction in the amount of time required to learn certain subject matter through the use of NIT, with enhanced rather than reduced comprehension. These improvements range across many subject areas.

The support for each of the above benefit areas ranges from speculation to hard quantitative research. The aggregate effect on education, including the financial implications, remains, of course, to be seen.

B. KEY ISSUES FACING NIT

Each of the previous benefits is itself an issue area to be explored further for validation or modification. In addition, there are a number of issues which the province must address if it is to realize the full benefits of NIT.

COST/SERVICE MATRIX

Content Cost	Increase	Maintain	Decrease
Decrease	Best Outcome	NIT Proves Efficient	Society May Accept
Maintain	Desirable If Society Will Pay	NIT Has No Impact	Wasted Effort
Increase	Must Be Demonstrated To Be Acceptable	NIT Proves Inefficient	Worst Outcome

1. Balancing the Cost/Service Matrix

On the facing page, a simple matrix has been constructed to illustrate the trade-offs between cost and service for NIT. Either of these components could, through NIT, increase, be sustained at present levels, or decrease. The ideal result would be to increase the quality of education while reducing the cost. The worst case would be to increase the cost while decreasing the quality of education. In this context, cost refers to the total system cost inclusive of teachers' salaries, NIT expenditures, overheads, etc. Content is the amount and quality of education provided.

In certain sectors of society, technology has been introduced primarily to reduce costs while delivering the same level of service. This was and is true during the early phases of the introduction of computers to the business world. Indeed, in those early phases, it was typical for absolute cost to increase and service levels to decrease until the entire organization had readjusted itself to accommodate the technology. Hence, we could visualize a scenario in which the technology is used to reduce the amount of time and cost required to teach a given subject area and realize those reductions by increasing class sizes, reducing the number of teachers, etc. Similarly, administrative support staff and costs should decline.

We can also visualize a scenario in which NIT is applied to eliminating a number of routine tasks. The additional time freed up would be employed in other ways to enhance the quality of the learning experience. The first key issue is to decide what the objectives are in the employment of NIT. Without a clearly articulated goal, there is a high risk that costs will escalate and society will then have to judge whether value has been obtained.

2. Responding to Expectation Levels

At the moment, there is a general sense that the old technologies were not particularly successful and the audio-visual phenomenon basically represented an add-on cost with limited demonstrable benefits. Recently, the advent of the VCR in the homes of many teachers has reactivated an interest in television programming for the classroom, but it remains to be seen how successful this will be.

At this time, there is strong societal pressure in favour of computers as parents urge their children and school boards to get on the bandwagon. Whether or not there could be a backlash also remains to be seen, but there is always increased pressure for results in an environment of high expectations.

3. Impact on the Teacher and the Teaching Profession

Generally speaking, teacher interest appears high, although it probably follows a normal distribution from skeptic to convert. The role of a teacher as a facilitator, using NIT as an integral component of the education process, needs to be defined better. At the moment, most teachers who have been exposed to computers have been through a general awareness and hands-on training program. Many will have taken a programming course and most understand how to load and execute simple programs. However, studies have shown that little work is being done, as yet, in computer-aided instruction and that limited teacher behaviour modification has taken place. Hence, considerable work needs to be done to find the best teacher/machine combination and then to train the teachers accordingly.

Apart from the impact on the individual, the impact on the teaching profession as a whole promises to be significant if NIT is employed fully. Here, there are considerable precedents. In fields such as engineering, drafting, legal, accountancy, etc., technology is beginning to have an impact on absolute job displacement. The evolution in these professions is generally characterized by a few enthusiastic pioneers who are self-taught and begin to apply the technology. They draw on experience in other disciplines and on their own native creativity. As a result, their own jobs are enriched and they become good advertisements for others in their professions. In time, technology begins to have a visible impact and a second wave of professionals, propelled as much by concern over job security as genuine enthusiasm, begins to embrace it. This leaves a large group of individuals who, for various reasons, do not become involved and they are the ones who are threatened with the prospect of obsolescence.

In major engineering firms today, substantially fewer engineers are required to design bridges or lay out the electrical and mechanical specifications for buildings. Much of this is computerized. Similarly, draftsmen have all but disappeared in major firms as the computer automatically produces the appropriate documentation. Competitive pressures in other professions, such as accounting and law, have sharply reduced the intake of new practitioners and substantial parts of their professional activity are now being computerized to reduce costs.

This spectre may exist for the teaching profession, even though it is somewhat more complex in terms of its potential use of technology. At a minimum, there will be structural shifts in the type of technical support professionals needed and in the mix of administrators, consultants, principals and classroom teachers.

4. Defining the Potential Scope for NIT

In no field is the computer fully capable of replacing all manual activity. The current stage of NIT in education is one of experimentation as subjects from music to history to science to mathematics are all being evaluated by educators in those fields as possible candidates for this new educational tool. The bounds are not yet known and new technologies, such as laser video disks, constantly expand the known boundaries. It is difficult to plan under such circumstances.

However, the educational field must seek to establish a base case, which is the extent to which available NIT can be employed to good effect. Some researchers maintain it is as high as 95% of the curricula, while others place the estimate considerably lower.

5. Achieving Computer-Literacy

One interviewee noted that it took some 500 years for the teaching of reading to move from the equivalent of university level to primary level. Mathematics and the sciences have had a similar, if less protracted, experience. Within the last decade, the teaching of basic computer skills has moved from the universities to community colleges, and now, more and more, into high schools and even primary schools. It is projected that, within another decade, basic computer literacy skills will be taught at the primary level and will be a non or remedial issue for high schools and beyond. Specialized courses in computer architecture and design will, of course, remain, but a substantial majority of the student population could be computer-literate within the next decade.

Therefore, many of the courses that are now taught at the universities and community colleges may themselves become obsolete and the rapid expansion of teachers and facilities developed to deal with these basic matters will become an issue to be addressed.

6. Managing/Coordinating the Spontaneous Growth of Interest Groups

Within an incredibly short period of time, there has been a spontaneous growth of interest groups in this field. A partial list identified during the course of the study includes:

- ECNO - The Educational Computer Network of Ontario was formed by the province and a number of school boards to facilitate the development of administrative support software.
- ECOO - Educational Computing Organization of Ontario is only five years old, but already has 2,500 members which have spawned a number of special interest groups to deal with particular facets of computers in education. Similar groups exist in other provinces and in the United States.
- ALSBO - the Association of Large School Boards in Ontario has formed a sub-group which has commissioned the development of 17 pieces of educational software.
- Metro 15 is a group of 15 Toronto area school boards which have combined to form an association of computer coordinators in order to share software, catalogues of educational software available, etc.
- Ontario Educational Software Project. 30 boards combined under this project to improve the cataloguing and publication of public domain educational software.
- OISE - This institution continues to be at the forefront of the development of minicomputer and microcomputer-based software.

- Computer Clubs - Like photography clubs from the past, numerous computer clubs have been formed in schools, and outside schools, around common products such as the Commodore Users Group.

Thus NIT, and in particular, the microcomputer aspect of this, is being propelled by its own momentum and the question of the extent and type of leadership, and support, to this phenomenon must be addressed.

7. Coordination of Government Initiatives

In addition to the spontaneous activities noted in the previous point, the provincial government and federal government have also launched a number of initiatives. These are often in different ministries or departments within the ministry. These include:

- The Computers in Education Centre of the Ministry of Education, which oversees the hardware and software strategy for this ministry.

- The Curriculum Branch which is also from the same ministry, but under a different assistant deputy who must decide on all educational materials.

- OESS - the Ontario Educational Software Services, established within TVOntario, which is within another ministry, but acts as the vehicle for the distribution of software.

- Independent Learning Centre which is a major user and could become a developer of some software materials.

- OISE - whose role in minicomputer development has been mentioned earlier, but which also has significant microcomputer development activities.

In addition to these activities, which undoubtedly do not comprise a complete list, the municipal level of government is active through its school boards, as noted earlier, and the federal government is supporting a number of initiatives through various departments and agencies. Many parts of these three levels of government also have connections internationally for the acquisition of educational materials. Thus, there is a major coordination activity to be undertaken to exploit NIT most effectively.

8. Linking of Educational and Economic Development Objectives

The present policy of the government is to stimulate economic growth in the high tech sector by using BILD grants to finance computer hardware and software development in education. Some maintain that this is counterproductive to education since it channels funds into areas that could be used better elsewhere. This argument contends that hardware dollars would be best spent in the development of educational software, leaving the private sector to deal with the hardware issue.

A related question has to do with the role of the publishing industry in the development of educational software and of the computer industry in teaching basic computer literacy courses. It appears that the publishing industry has yet to make up its mind as to whether or not to use NIT in support of published media, or to shift from published media altogether in the educational field. Some computer companies continue to offer basic computer literacy courses although primarily to the adult population.

It may be that the dual objectives of supporting economic growth and enhancing NIT in education may be detrimental to both. The issue of the public/private sector roles must, therefore, be re-examined.

9. A Hardware Strategy Is Needed.

Computer hardware has evolved from terminals connected to powerful mainframes, to terminals connected to powerful minicomputers, to relatively unsophisticated 8-bit microcomputers (Commodore and Apple) to more sophisticated 16-bit microcomputers (ICON) to the prospect of networked (connected) 16-bit and 32-bit microcomputers. The cost of equipping a full teaching classroom with computers and providing at least one computer in selected classrooms has risen as the required capability of the machine has increased. At the moment, most educational jurisdictions are highly committed to microcomputers although an economic case could probably now be made for having a powerful 32-bit minicomputer in each school, supporting terminals for educational and administrative purposes. Microcomputers are cheap on an individual basis, but begin to get expensive as one contemplates having 40 or more of them in a school. The cost implications of this are addressed later in the report, but an important issue to address is the hardware strategy itself.

10. Establishing an Inventory of Quality Educational Software

Lessonware refers to a computer software program which teaches a given lesson. Courseware refers to a series of lessons which have been brought together to teach an entire course. Thus, a particular lessonware may teach the subject of fractions while a particular courseware may deal with the entire Grade 6 mathematics program. At the moment, there are literally hundreds of educational computer programs available, some of which may be considered powerful enough to satisfactorily cover a particular lesson. There is limited courseware available as yet to deal with an entire course, whether Canadian history, Grade 9 geography or Grade 2 reading. Before meaningful inroads can be made, a sufficient inventory of lessonware and courseware must be developed.

An interesting related issue is whether or not this material should be made available to the public at large. For example, it is possible now for parents to obtain textbooks which their children use in school, although this is not well publicized and is not that easy. Given the interactive nature of NIT, it is conceivable parents may wish to avail themselves of some of the teaching materials for use on their own computers at home. In the primary grades, it is clear that the child needs a significant amount of classroom time for social interaction and direct contact with the teacher. In the senior grades of high school and in university, students are increasingly held personally responsible for directing their own educational processes. Insufficient research is available to tell where the line can be drawn, and in which subject areas. Nevertheless, NIT will call into question the need to achieve mastery of the subject material through attendance in the classroom.

11. Achievement of Critical Mass

Much of the thinking and research today indicates that a minimum critical mass is needed in order to reap the benefits of NIT. Critical mass is usually defined in terms of the number of hours of available computer time for students, the number of computer classrooms, the quantity of quality lessonware and courseware, the extent of the educational data banks, the number of trained teachers, and the coverage of the telecommunications network. Critical mass is easier to define in terms of acquiring basic computer literacy than it is in effectively employing the technology in computer-aided instruction. Thus, the required critical mass of CAI must be defined and the financial and related implications of that assessed, if the investment is to be managed most productively.

12. Prevention of Inequalities

This issue basically deals with the traditional problem of the rich getting richer and the poor getting poorer. During interviews, one of the individuals noted that he had visited Colombia, an outwardly backward country, where considerable strides had been made in the application of computers to education. However, they were very narrowly applied to the children of the wealthy class in that country. More well-to-do boards and more well-to-do parents could widen the educational gap in this province through the use of NIT. It will be important to develop policies to minimize this otherwise natural consequence.

In summary, it is clear that NIT is a largely unexplored phenomenon. These issues, individually and collectively, need to be reviewed in the context of an overall strategy for NIT.

NIT holds considerable promise for education, but its evolution must be carefully managed. That management must provide for creative exploration as well as businesslike application. A mechanism for approaching this is described next.

III. CLASSIC COST/BENEFIT MODEL FOR TECHNOLOGIES

Computers have been applied to an increasing number of segments of our society over the last 25 years. During that time, a reasonable body of professional experience has been gained in managing that process. Generally speaking, it begins with a statement of strategic goals of the enterprise, followed by a thorough exploration on how technology might be employed to assist that enterprise to achieve its goals. These seek market or competitive advantage as well as cost reduction and operational service improvement. Most sectors are more advanced than education, to the extent that they can now reasonably define how technology may be employed. This is still evolving in education.

The next step in the classic process is to develop an "architecture" of all the information that is needed, and from there, to define all of the computer applications, generally broken down by systems family. The next step is to compare this with what the enterprise already has in place, which has often grown up in an ad hoc fashion. The gap between the two represents the work to be done.

At this point, a number of key strategies are defined. These include a hardware/network strategy appropriate to the particular needs, a software development/acquisition strategy, a personnel resourcing strategy which deals with the number and type of personnel needed to develop and implement the systems, an organizational strategy which defines who has responsibilities and leadership for various segments of the technology, and an implementation strategy which defines the pace at which the enterprise can reasonably proceed, given inevitable resource limitations. A training program is also identified as well as the required infrastructure of planning and control mechanisms to manage the whole process.

The application of this methodology to NIT might result in the following sequence of events.

1. While we can assume that the general goals of education are well established, the degree to which NIT can effectively support those goals is not known. Accordingly, the first step will be to define the art of the possible within the bounds of current knowledge. This could involve constructing a matrix of all grade levels from kindergarten to Grade 13 against all subject areas. Each cell of

the matrix will then be examined to define the degree to which NIT could be applicable and what the best mix of manual and technology learning would be for that cell. This would proceed from a general level down to specific courseware and lessonware guidelines.

2. Identify cross-educational opportunities through the combination of various subject areas. This may result in new fields of study or the possible reduction in others.

3. Aggregate the total requirements, probably by sub-groupings such as subject area and/or grade level, into a total requirements definition.

4. Define the specific research studies which need to be undertaken.

5. Establish priorities for opportunity areas, based on known benefits, ease of development and ease of implementation.

6. Define a hardware/network strategy most appropriate to the delivery of the specified NIT.

7. Define enabling mechanisms. In order to achieve the plan, a number of specific policy and procedural issues will have to be addressed including, in addition to hardware and software, the matter of teacher training, communication of the strategy, planning and control mechanisms, etc. This will be a complex, system-wide strategic and operational plan.

8. Estimate the cost implications. These will be both one-time and ongoing, and this element is the subject of the next section of the report.

9. Identify and quantify the hard and soft benefits. In order to justify the increased expenditure for NIT, an attempt must be made

to identify and track the expected benefits. If these are to be in cost reduction or cost avoidance terms, or in operational terms such as teaching hours or class sizes, these expected benefits must be quantified and a specific program mounted to realize them. In the absence of targeting such benefits and focusing on their achievement, they may well not materialize. This has been the experience of other sectors of society who have been involved through several stages of the adoption of technology.

10. Define the probable impacts on the present system, bought about by implementation. By this is meant the potential changes in job content, approaches to the way in which individuals carry out their work, the impact on the attitudes of people who must participate in implementation, etc. This is an often missed step in the implementation of a strategic plan and many enterprises are only now realizing its importance. In the case of NIT, this will be a critical step.

10. Aggregate all previous activities into an overall strategic plan for the introduction of NIT. This will be a massive strategic plan, similar in complexity to that developed to support a major construction project like a nuclear reactor or the implementation of a major piece of new legislation such as Unemployment Insurance or Workmen's Compensation. Such a plan must be constantly maintained and modified as new data and actual results become available. Just one segment, teacher training, can be a major sub-project in itself.

11. Establish an appropriate pace for proceeding, based upon resource limitations.

This somewhat simplistic approach is designed to treat the entire elementary and secondary educational system in the province as a single entity, such as a major corporation or entire government ministry. It presumes that all elements can be studied concurrently and a single integrated strategy for the introduction of technology, where appropriate, can be developed. While this undoubtedly will not be practical, it still represents a useful framework for coping with that which is practical. In a subsequent section of this report, some possible strategies for proceeding are described.

IV. COST ELEMENTS OF NIT

The costs of achieving a critical mass for NIT promise to be substantial, although significant sums are already being invested by the school boards and the province. Arriving at a definitive estimate of the costs to achieve a critical mass or, indeed, even a cohesive determination of the components, is difficult for a number of reasons. These include:

- Technical changes occur so quickly that the basic components vary and previous investments may have to be written off due to obsolescence.
- The absence of standardization in hardware makes cost estimates and subsequent lessonware-sharing difficult.
- Major aspects of the field need significant research, and the results may radically change implementation strategies and cost elements.
- There is insufficient experience in the mass development and production of cost components to permit a reasoned estimate to be established.

Nevertheless, based on the available research and experience, five broad cost elements can be identified. They are education software, hardware, transmission, training and management/overhead. Each is described in the following sections.

A. EDUCATIONAL SOFTWARE

Developing quality educational software essentially entails labour costs for specialists in education and the new technologies. An education specialist must design the program content and technology specialists in computer systems design, programming, testing and graphics must actually produce the program. Further specialties needed are documentation and packaging, both for the student users and the teacher/facilitators.

If video disk is being employed, media specialists to design, produce, direct and edit the videos are needed as well. A further group of individuals who could be involved are curriculum specialists who would review the material and act as an editorial board before its release for general usage. While other costs are incurred for materials and the use of computer time for development, they are not significant.

Costs for an individual lesson, if developed from first principles, seem to be running at about $75,000, although they could range considerably around this average. It is likely that lessons could be purchased for less than that if the developer has a broader market than just one province.

An entire course consists of many lessons, estimated to be about 25. However, repetition and scale economies are likely, so that a course cost of about 10 times a lesson cost would be reasonable. A U.S. estimate puts the cost of an entire semester course at $100,000, which seems low, while a French estimate puts the cost at $2.5 million, which seems high. An average of about $750,000 is probably accurate enough at this point for estimating purposes. Interactive video disk programs are more expensive than those developed entirely on computers. Finally, costs would have to be allowed for translation to the French language. Thus, a working estimate of $1 million per course might be assumed. As much of this is labour cost, major reductions due to technological advances may be unlikely, although improved authoring languages may help somewhat.

A global cost estimate for "automating" the entire elementary and secondary curriculum would be as follows:

- Courses
    - Grades 1 - 8: 8 x 5 = 40
    - Grades 9 - 13: 64 (30 credits needed from 64 in total, course cost estimate presumes that 3 levels of difficulty are incorporated in each course and less in component)
    - Special education, etc. = 46
      Total: 150
    - At $1 million each = $150 million
- Lessons
    - A number of special lessons that do not fit into specific courses may also be needed. The Educational Technology Division of the Ministry of Education has estimated these at 500. A more conservative estimate of 25 per grade would be 325. This assumes the inclusion of grade difficulty levels in the middle and high schools not covered by the $1 million courseware estimate.
    - Thus, at $75,000 each = $25 million.

Therefore, a global cost estimate for developing the courseware and lessonware for the entire elementary and secondary curriculum would be $175 million. As indicated, we are still at a very early stage of experience in this area and hence this estimate could vary significantly in terms of the number of lessons and courses and the cost of development of each.

As courses change and new data become available, the lessons and courses would have to be modified or new ones developed. An average life span of five years would mean an additional investment of 20% per year once the inventory was built up. The total annual cost for educational software would, therefore, depend on how fast the government wishes to build up the software inventory. If done over a ten-year period, there would be no replacement cost for five years, at which point, in theory, the first year would have to be totally replaced. Thus, the cost in the sixth year would be $35 million, which is the cost for the sixth year plus the first year replacement. Costs would be double each year for the last five years so that by the end of the tenth year, the $175 million in original development costs would be supplemented by $87.5 million in replacement, for a ten-year cost of $263 million. Ongoing annual costs would be $35 million for the 20% replacement factor.

B. HARDWARE

Simple, but fully configured, 8-bit microcomputers such as Commodore and Apple cost around $1,000 each with an educational discount. However, the more powerful 16-bit micros, such as the ICON, cost $4,000 which is a weighted cost between the computer and the fixed storage devices. These 16-bit micros are seen to be necessary to process lessons and courses at the appropriate level of sophistication. Indeed, new 32-bit micros are now appearing on the scene. While there are significant labour cost elements in hardware as well, the cost of mass producing a 16-bit microcomputer should come down to that approaching an 8-bit. For estimating purposes, we might assume a progression of $4,000, $3,000, $2,000 and $1,000 in constant dollars, each accounting for 25% of the total inventory, or an average of $2,500 each.

A global estimate for hardware depends on how much time each student is expected to have access to a computer each day. With 1,800,000 students in Ontario's elementary and secondary system, a computer for each of them would represent a total cost of $4.5 billion. Critical mass has been defined as one-half hour per day per student, which would be one computer per ten students. This, however, seems insufficient for significant amounts of student-centred learning to take place. Thus, an estimate of one computer for every three students should permit major in-roads of the technologies.

On that basis, a global cost estimate would be $1.5 billion. Again, assuming a ten-year build-up and a 20% replacement cost factor, a ten-year cost would be $2.25 billion and an ongoing cost per year of $300 million. With this level of expenditure, however, the wisdom of microcomputers over less expensive terminals to a minicomputer comes into question.

C. TRANSMISSION

There are two aspects to this cost element. The first is to operate land or satellite-based telecommunications networks linking all of the 168 school boards to a central source and, possibly via a telecommunications "highway" concept, to each other. The network could be expanded further if individual schools were to connect electronically to their school board or to the central source directly. Indeed, there may be as many as 20 school boards in the province which now have networks to their schools. The primary uses of such a network would be to download educational software from a central library, permit access to data banks of educational information or educational services, both private and public, exchange administrative data and messages, and deliver distance education. This cost has fixed and variable components and the total depends very much on usage.

The second aspect is local area networks which are designed to link microcomputers located in close physical proximity. The costs for these are generally fixed and can be considered part of the original acquisition cost of the hardware. However, much remains to be done to achieve a high level of efficiency in a local area network and considerable development is currently underway in this field.

Cost estimates for transmission are even more problematical than the other cost elements. The set-up cost for school boards for the appropriate telecommunications receivers could be in the order of $1,000-$15,000, for a total cost of approximately $2 million. Consulting studies and testing could double the set-up costs. If the network is used to download software and transmit information, the ongoing operating cost would not be significant. If, however, the network is "on-line" so that hundreds of thousands of computers and terminals are linked to data banks or central computers, the cost will be prohibitive. Thus, it will be necessary to structure the network to minimize its on-line aspects.

It is presumed that school to school board networks would not be needed to transmit educational software, but may be needed to acess data banks. For estimating purposes, an ongoing cost of $5 million per year for a communications network is assumed.

D. TRAINING

Most training that is provided today is directed to teaching "about" computers. These are awareness type courses which dispel the fear of computers, provide practical experience on how to load, execute and save programs, and teach the fundamentals of programming. Slightly more advanced courses deal with how to maintain databases, write more complex programs or utilize graphics capabilities.

More important, however, is the need for training on how to "use" computers in a classroom setting for the teaching of other subjects.

Little effort is currently going into training of this type. Finally, training in authoring languages is needed so that teachers who are so inclined can begin to develop their own teaching materials. Research as well as training is needed in these latter two fields.

Computers and the other new technologies will only be employed on a wide scale when they are relatively easy to use. Thus, it is likely that, in the future, few teachers will know how to write programs, nor will they need to. Training courses for teaching "about" computers are estimated at $1,000 per teacher. This subject matter is already being covered in schools and universities now so that, in the near future, it will be unnecessary for new teachers. Probably 20% of the Ontario teachers currently on staff have already received this type of training through school board programs, so the other 80% of the present 85,000 teachers will still need to be trained. This represents a cost of about $68 million. If conducted on a mass scale, the cost would probably be about $50 million. Indeed, most of the courseware has already been developed and is being delivered by TVOntario, by computer coordinators in various school boards or by the computers themselves through easy introductory programs.

The cost of training on how to "use" computers and how to become more of a facilitator is unknown. Once research has been conducted and field-tested, such training will become a routine part of the teacher training programs. Indeed, such courses are now beginning to be offered to student teachers. For estimating purposes at this time, a cost of $3,000 per teacher on top of awareness training might be assumed. While there are 85,000 teachers today, teacher populations are declining and the total trained may only be 70,000. Hence, the cost of this training could represent $210 million.

Thus, the total cost of training the Ontario teachers is estimated at $260 million. Again, this is a highly speculative estimate.

Conducted over ten years, the cost per year would be $26 million. Ongoing refresher training will likely become part of the existing training facilities for teachers, replacing other types of training programs. Hence no ongoing costs, marginal to present costs, are assumed.

E. MANAGEMENT/OVERHEAD

The elements included in this category are contract administration for the acquisition of hardware and educational software, technology specialists, NIT educational consultants, the establishment of data banks, the creation of communications (i.e., newsletters, curriculum updates), facilities, etc. The cost to set up NIT on a global scale could be in the order of 2% of the hardware/software purchases, or 2% of $1.675 billion. This represents a further cost of $33.5 million. Again, allowing for the 20% replacement factor, spread over ten years, the cost per year would be $3.35 million in the first five years and $6.7 million thereafter.

The annual costs for the other management and overheads will be somewhat accommodated by the changing nature of the jobs of existing professionals. However, new expertise will have to be hired. At a staff level of ten per major school board, five for medium boards and two for smaller boards, at an average cost of $40,000 each and the distribution of 20 large boards, 80 medium boards and 25 small boards*, this would represent an ongoing cost of $26 million. Assuming some reductions in other areas or retraining over time, there could be a net cost increase of $20 million. During the first five years, this might be in the order of $30 million as the program becomes established and special studies and planning activities are completed. Thus, a total estimate of about $35 million per year for the first five years and $25 million thereafter may be used for estimating purposes.

* Only 125 of the 168 school boards are large enough for full time staff.

These costs, taken with all the caveats noted, may be summarized as follows for a ten-year build-up of a totally automated educational system. The numbers are in millions of dollars and are in constant 1985 dollars.

Cost Element	Years 1 To 5	Years 6 Onward
Software	$ 18	$ 35
Hardware	150	300
Transmission	4	5
Training	26	26*
Mgt/O.H.	35	25
TOTAL PER YEAR	$ 234	$ 391

* Years 6-10 only.

It is worth noting that, as significant as these sums appear, they represent 3.8% and 6.3%, respectively, of the current annual budget of $6.2 billion. However, there are a number of reasons why the actual cost incurred may not be as high as shown. These are discussed in the next section.

V. THE COST BENEFIT DILEMMA

There are several reasons why cost levels noted above are unlikely to be realized. These include:

- Not all courses are likely to utilize NIT.

- A ratio of one computer station for every third student may not be necessary to achieve significant usage and benefit.

- Through acquisition programs and improved authoring languages, the average cost per course and lesson may drop to below $1 million and $75,000, respectively.

- There is already a completed or in-process inventory of, perhaps, 200 satisfactory lessons, out of the estimated total of 1,835 required (150 courses at ten each and 325 individual lessons).

- There are already some 46,000 computers installed in Ontario schools, although most of these are of the 8-bit generation. Nevertheless, it is possible that many of these can be employed to good effect for part of the lessons to be taught.

- Not all 85,000, or even 70,000, teachers may need to have in-depth training as facilitators working with computers.

- The transition period may well be longer than ten years. Indeed, it would be unduly optimistic to believe that the entire system could be "automated" with NIT in a ten-year time span. Doubling it to 20 years and reducing computer replacements, for example, gets the annual cost down to the $100 to $150 million range.

Having said the above, there are also several reasons why the costs could be higher than those stated. These include:

- The possibility of poor implementation and/or strong resistance which will lead to the additional cost being add-ons, rather than replacement. Half an implementation could increase the total educational system cost far beyond what it would have been with no implementation at all.

- Traditionally, training by teachers has been seen to be an increase in their qualifications leading to increased salaries. This philosophy would have to be changed to one in which training for NIT is seen to be fundamental to maintaining currency in the field rather than increasing one's compensation.

- The province and, more importantly, individual boards, could choose to opt for much higher quality education at the same or higher cost by reallocating rather than eliminating replaced manpower. In other words, the cost/service matrix shown in Section II-B of this report could be balanced at a relatively higher content level than the current educational system. There will be strong pressure to do this.

Nevertheless, the potential benefits are enormous, as noted earlier in this report. The key challenges are to quantify those benefits, target for their achievement, and rigorously monitor the implementation process so that they can, in fact, be achieved. In highly simplistic terms, the reduction through attrition of 10% of the staff, directly related to NIT, would represent annual cost savings of $340 million which is substantially more than the annual cost of implementation in the first five years, and approximately the annual cost thereafter, assuming a ten-year global implementation program. As well, considerable investment is already being made in hardware, software and training, all of which is included in current budgets. Although no estimates are available, it is likely that system-wide expenditures are in the $25-50 million range annually. The net increase over current expenditures to achieve global implementation may, therefore, be less than the estimates on page 31.

In other words, the benefits may well be realized and justify the cost, while the field is already well underway and being carried forward by its own and society's momentum. Hence, the government is well advised to pursue the issue of NIT further. In the next section, strategies for proceeding are set out.

VI. POTENTIAL STRATEGIES

The full potential of NIT can only be realized, at reasonable cost, if a carefully planned and managed implementation program is followed. Given that there are so many unknowns in this field, such a program must involve a considerable amount of research and study, as well as a disciplined introduction of that which is known and becomes known through research. The present approach in all jurisdictions, not just Ontario, appears to be one of proceeding on a broad front, learning as one goes. Set out below are ten recommendations which, in aggregate, represent an aggressive but controlled strategy for evolving NIT further.

A. DEVELOP A FOCUSSED SOFTWARE STRATEGY

The intent here is to identify the high potential areas for software development, based on experience gained to date. It presumes a proactive approach to the specification of lesson and course content. Steps will include:

- Construct a matrix of all subject areas and all grade levels to identify all courses and lessons which could potentially benefit from NIT. A preliminary screening would be conducted.
- Form subject or grade project teams drawn from the school system.
- Have these teams develop specifications for the courses and lessons in their area.
- Develop cost estimates from these specifications.
- Establish priorities based on agreed on criteria.

- Select a few areas of high potential and priority.
- Define probable changes in teaching methods and approaches which would likely result.

A process to guide the subject and grade teams would have to be developed. This might be similar to the process developed in the social services field when multi-disciplinary teams were brought together to assess the effectiveness of the child welfare agencies in all 51 municipalities. At the conclusion of this process, contracts for the development of lessonware and courseware could be let and available software could be reviewed for possible acquisition.

B. REVIEW THE HARDWARE STRATEGY

Based on the assumption of an eventual high level of penetration of computers and terminals into the system, the hardware strategy now being followed in the province should be thoroughly reassessed. This would include:

- A reassessment of the potential and costs of the alternatives: stand-alone micros, networked micros and minicomputers situated at the school. Terminals to central mainframes are likely to be prohibitively expensive.
- A review of the potential use of the existing inventory of 8-bit micros, either on a stand-alone basis or in some way connected through telecommunication lines through a network. Most hardware purchased today in Ontario continues to be of the 8-bit variety.

- An assessment of the effectiveness of the ICON program and an update on the private sector-supplied alternatives such as Apple and IBM compatibles.

A continuation of the present hardware approach will lead to a further proliferation of 8-bit and 16-bit microcomputers, together with the occasional terminal to a minicomputer or mainframe. This will lead to a "protecting of the investment" mentality which would subsequently hinder the realization of NIT.

C. FORMULATE A COMPREHENSIVE TEACHER TRAINING PROGRAM

This is perhaps one of the most important priorities for action. It will entail:

- Researching the field in North America and Europe to establish the present state-of-the-art of teacher training in the use of computers in a teaching setting.

- A review of present methods, subject matters and results in Ontario.

- The launching of specific research studies, with particular emphasis on the subject and grade areas targeted in the focussed software strategy.

- The definition of a curriculum of training programs.

- The costing of those programs.

- Planning an appropriate implementation program keyed to the availability of lessonware and courseware.

Since this is a relatively unresearched aspect of NIT, Ontario may well be able to assume a leadership role in the development of teacher training programs.

D. CREATE A PILOT "WIRED" SCHOOL

A well established industrial technique for dealing with new technologies is to create a pilot program. Such an approach is worth considering here through the establishment of one or more pilot schools at the elementary, middle or secondary levels. Such a school would become a test site for new and evolving NIT courseware and lessonware, proving out training methods, modifying curriculum through cross educational training, accessing educational data banks, diagnosing learning difficulties, using technology for professional and administrative support, measuring effectiveness in terms of comprehension and reduction in teaching time and, possibly, using authoring languages to supplement the software.

Such a pilot could be similar in concept to the French immersion programs which were developed many years ago and refined as experience was gained.

E. ASSESS THE MERITS OF CREATING AN ONTARIO EDUCATIONAL COMPUTER CONSORTIUM

The current approach to the development of exemplary educational software is to support small private sector entrepreneurs. Such a policy is laudable in that it helps to stimulate the private sector, but experience has shown that many such small high tech firms fail. The reason for their failure is due to a lack of capital, marketing, distribution and management expertise. Generally, they are run by high tech gurus who lack the commercial expertise in the areas noted.

In Minnesota, an educational computer consortium was formed which is probably the biggest in North America, if not the world, for the development and dissemination of NIT materials. Manitoba has a similar organization. This model should be studied in detail with a view to establishing whether or not Ontario should establish a Canadian counterpart to Minnesota.

F. INITIATE DISCUSSIONS WITH OTHER PROVINCES

Obviously, NIT promises to be quite expensive. At the same time, much of the required curriculum is likely to be constant across most provinces in the country. Therefore, there may be considerable potential for sharing resources and reducing cost.

Particular opportunity areas include software sharing, training methods and programs, telecommunications experience and perhaps even the networks and, if possible, some form of hardware standardization and standards. While the major cost element is hardware on which there may be few economies of scale, substantial funds are required for the other cost elements and may benefit from sharing and coordination among the provinces.

G. CONDUCT A STUDY INTO THE TELECOMMUNICATIONS NETWORK

This study should include:

- A usage analysis, including educational, administrative support, message switching and teleconferencing uses.
- Technical options for building and maintaining the network, including local, land and satellite aspects.

- The cost make-up, both fixed and variable.

- The current state-of-the-art and possible new developments, including the hardware and software aspects of the computers and terminals needed to connect to the network.

This particular aspect of the NIT program is less urgent than others, since limited use would be made of the network until a reasonable inventory of software and educational data banks has been established. Nevertheless, a base case study should be prepared so that, as usage changes and new developments come on stream, the government will be able to monitor and react quickly.

H. ESTABLISH A LIAISON MECHANISM FOR THE VARIOUS INTEREST GROUPS

Earlier in the report, a number of interest groups which have grown up spontaneously were identified. It is timely for the government to develop an up-to-date inventory of the various interest groups, including their mission, goals, membership and current status. A liaison officer for interacting with these groups should be appointed so that this important human network can be called upon to facilitate the evolution of NIT in a planned and managed manner.

I. REVIEW THE ORGANIZATIONAL ARRANGEMENTS

NIT is a fast changing field and all three levels of government and the private sector are active in it. It is timely to reassess the roles and activities of all government departments and agencies to ensure that maximum benefits are being obtained for the investment.

J. DEVELOP A COMPREHENSIVE PLAN AND MONITORING MECHANISM

Given the significant sums that are being committed to NIT, and the potential impact on the educational system, an appropriate plan and overall strategy is required. This will entail:

- Defining all activities and facets of NIT which are underway.
- Developing time, cost and manpower estimates for each activity.
- Developing and implementing various data gathering instruments and methods to obtain feedback on the various activities. This will include, for example, annual progress reports from the NIT coordinators in each school board as well as regular reporting back on progress on the various initiatives noted earlier.
- The use of automated project management systems now well established and employed for major projects such as this.
- The continual revisions to the plan, based on data received.
- Ongoing monitoring of progress in each of the activities, together with appropriate corrective action or re-targeting.

NIT is an undertaking of substantial proportions and requires a comprehensive plan to guide its implementation and realize its expected benefits. Planning and monitoring techniques for complex projects are well established and have been used for major social and private sector projects in the past. Such techniques should be brought to bear on NIT.

Potential strategies for NIT include a passive reactive approach in which the government monitors activities and suggests changes from time to time, a low key coordinated approach in which it attempts to bring together the initiatives of many others, and a proactive, directive approach. What is recommended herein is the last of these options.

VII. CONCLUSION

Technology appears to be the primary focus area for the balance of this century across a broad number of fields, and throughout most of the world. The field of education has begun to embrace this as well and is being carried along by its own momentum and general pressures from society. It is reasonable to state that NIT has the potential to have a significant structural impact on the educational system. However, it could prove to be an extremely expensive program if it is not well managed and controlled. Numerous issues remain outstanding and need further study. Numerous jurisdictions other than Ontario are proceeding in the field at varying speeds. It is incumbent upon the government to ensure that it has a well thought through, pro-active plan for employing NIT to its fullest benefit.

CURRIE, COOPERS & LYBRAND

R Hossack

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APPENDIX I

SCHEDULE OF PERSONNEL INTERVIEWED

J. Koneig, President	International Image Technologies
M. Murray, Co-Ordinator for Computer and Audio Visual Support Services	Windsor Roman Catholic School Board
Gordon McKye, Co-Ordinator for Computers In Education	Etobicoke Board of Education
T.S. Allan, President	Control Data Canada Ltd.
D. Dixon	Ontario Teachers' Federation
J. Freeman	TV Ontario
N. Parker, Manager School Board Services Unit (ECNO)	Ministry of Education
W. Mitchell, Educational Technology Development Division	Ministry of Education
D. Penny, Assistant Deputy Minister, Education Technology Development Division	Ministry of Education
W. Oliver	OISE
R. Arno, President	Microdesign, Division of CEMCORP
T. Boucher	Independent Learning Centre
D. Morin, Commissioner L. Maki M. Cyze	Commission on the Financing of Elementary and Secondary Education in Ontario

APPENDIX II

SCHEDULE OF MATERIAL REVIEWED

1 - 12 Proceedings of The International Conference on Education and New Information Technologies, Paris, France, 9-12 July, 1984.

13 The Pepper Wood EL-H1 Report on computers in Canadian Education, 1980-86.

14 Educational Computing Networks of Ontario, 1985 Branch Review.

15 Ibid, Position Paper on Possible Future Direction of ECNO, Sub-Committee of ECNO Superintendent's Committee.

16 Ibid, ECNO Financial and Governance Restructuring, 1985-86.

17 The Ontario Teachers' Federation Submission to the Cabinet, 1981: Effect of Computer/Communications Technology on Education.

18 Ibid, January 13, 1982 follow-up.

19 The Ontario Institute for Studies In Education, Computer Assisted Instruction and CAI Courses in the Community Colleges.

20 "Ontario Ministry of Education Specifies Its Microcomputer", Robert L. McLean, OISE, October, 1983.

21 Memorandum of Agreement between the Government and Developers of Lesson Ware/Course Ware (i.e., Sample Contract).

22 Ontario Universities: Options and Futures, The Commission on the Future Development of the Universities of Ontario, December, 1984.

23 Interactive Image Technologies Inc., various materials.

24 Ontario Ministry of Education - Call For Computer-based Learning Materials, 1984-85-Number-1.

25 ECOO OUTPUT, Educational Computing Organization of Ontario, Volume 5, Number 2.

26 Computers in Ontario Education, Final Report of the Provincial Advisory Committee on Computers in Education, July, 1983.

27 - 30 TVOntario, Educational Series, French and English, Annual Report 1983-84 and Proposed Activities 1984-85. Evolution of TVOntario's Edutex and Edutel Data Base Systems and Research Instruments.

31 Education Technology - Is There Still Hope for Ontario? A submission to the Commission on the Financing of Elementary and Secondary Education in Ontario, April 24, 1985.

32 The Effects of Computer Based Marking on Completion Rates and Student Achievement for Students Taking a Distance Education Course, Independent Learning Center, Ontario Ministry of Education.

33 A Provincial Policy Response to the High-Tech Impact on Education, Carleton-Edinburgh Joint Seminar on "High Tech Impact on Education", October 26/27, 1984.

34 Report, Etobicoke Board of Education, Directors Task Force for Computers in Education, April, 1984.

35 Computers in Education, Long Range Plan, The Halton Board of Education.

36 The Dufferin-Peel R.C.S.S. Board, Five Year Plan, Computers In Education.

DEMOGRAPHIC AND ECONOMIC TRENDS,
WITH CONSEQUENCES FOR
PUBLIC SECTOR EDUCATION
IN ONTARIO

A discussion paper prepared for the

Commission on the Financing of
Elementary and Secondary Education
in Ontario

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CONTENTS

Page

I. Introduction 257

II. Trends and Factors Influencing Public Sector Education 261

Demographic Trends 262
Sociological Trends 272
Economic Trends 277
Political Trends 290

III. Consequences and Directions for Education 295

Consequences 295
Possible Directions 310

IV. Notes 317

V. Bibliography 318

I. Introduction

The scope and the purpose of this paper were stated by the Commission in its directions to:

"1. conduct a search of the literature to identify and describe trends and factors in economics, demographics, politics and other social factors in Ontario;

2. describe how these factors could impact on public sector education in Ontario in the foreseeable future;

3. delineate some of the consequences of the impact of the factors described in item 2 and estimate possible directions of public sector education."

These are broad terms of reference, especially when the time and resources assigned for the study were quite limited. What follows here is an attempt to describe the relevant trends, their impact and consequences, in a comprehensive yet concise manner, such that a reader can quickly form a broad perspective on the contemporary education scene.

The relevant literature for this study includes several categories: futures studies, forecasting methodology, demography, macroeconomics, sociology, education, and statistical series. Outstanding reference works as well as specialized items in each of these areas comprise the bibliography for this paper.

Numerous trends could have been identified and woven into the framework of this study, but the emphasis is on trends that have a broad and enduring effect rather than superficial or secondary developments that may have current popularity but no enduring impact. Similarly, the trends that can be expressed quantitatively are given preference. More subjective, qualitative changes are included later - particularly to show where there should be some effort to measure these changes and their effects.

Some current issues in Ontario education are expressly omitted from this paper. First, the implications of extending provincial financial support in the separate (Roman Catholic) schools are the subject for another current provincial commission, and can be excluded from this study. However, "public sector education" is considered to include the separate school system, and is so treated in this paper. There is also a provincial commission examining the possibility of public support for the private school system. This part of the total education system is therefore accorded little direct attention. Yet another commission has recently reported on the future development of Ontario universities.

In looking at "trends", one should differentiate a number of closely related terms such as projections, forecasts, and scenarios.

Projections are statements that follow from known conditions and alternative assumptions, extrapolated into the future. But one must remember that

> Projections are not predictions. They indicate the direction and magnitude of possible developments, based on past and present circumstances and assumptions about future trends in important variables...They must be evaluated in light of the conditions when they were produced.[1]

Forecasts are usually stronger, more confident statements about the future. These often are based on projections, but also take into account the forecaster's informed or expert judgment on the most appropriate assumptions and other qualitative adjustments to the raw projections.

Scenario is a term taken from Italian traditional comedy-theatre, where a number of players were given a theme to enact. The success of the performance depended on the experience, resourcefulness, and imagination of the players. Similarly, the creation of scenarios for the future has become in some cases a modern version of comedy-theatre, with scenarios that are more artistic than accurate.

In dealing with trends, one must distinguish early growth stages from the later, maturing stages. Exponential growth seldom continues unchecked; sooner or later, unexpected factors have a dampening effect on the growth rate. In other cases, there are logical limits to the exponential expansion. For example, in the late 1960s, someone developed a projection showing that if public financing for the Canadian postsecondary education sector continued at the same assumed growth rate, virtually all of Canada's GNP would be allocated to postsecondary education by the mid-1990s. Obviously, other factors intervened and education's share of GNP actually declined. Similarly, it is misleading to extrapolate growth rates for some recent technological changes. Further improvements in fields such as telecommunications, electronic data processing, and supersonic travel, will occur more slowly and have less quantitative impact than they have had recently.

The approach in this paper is to identify trends in the historical data, and then to suggest how these might develop and impact on the education sector. There is no attempt to provide formal projections. Data for Ontario are used almost exclusively. While some trends are nationwide, even worldwide, there are cases where Ontario experience is different from that in other provinces. For example, the industrial composition of the labour force is different in each province due to regional differences in the Canadian economy.

Any attempt to suggest how major social sectors such as education might change over a decade or two must be tempered by the sobering recognition that important social trends and specific economic events were unanticipated by any commission, task force, or think tank. What has possibly been the most significant social change in the past 25 years - namely, the dramatic increase in female participation in postsecondary education, and in professional schools such as law, engineering, and medicine, and the married female participation in the labour force - was underestimated in 1957 by the royal commission on Canada's economic prospects. More recently, the OPEC price increases in the 1970s and the record-setting high rates for inflation, unemployment, and interest in the 1980s, were foreseen by few economic forecasters. Even the Tory landslide election in September, 1984, was not predicted until the last few weeks or days.

To speak of the "foreseeable future" is obviously a contradiction in terms. It is assumed in this paper to refer to the next decade - with an occasional glimpse at the year 2000. This is a difficult time-frame within which to make significant speculations. A noted futurist has commented that

> The five to fifteen year future is an awkward distance to deal with: not remote enough to support visionary constructions, not close enough to hold much interest for practical people, yet quite close enough for statements about it to evoke inquiry about one's methodology and documentation.[2]

The next section of this paper presents quantitive evidence on major demographic, social, economic, and other trends in Ontario society during the past few decades. In the subsequent section, the consequences of each trend are discussed in terms of any impact on the educational sector. Some such effects are widely known and need only be mentioned. In the latter part of that section, the details are drawn together to portray some general directions one might expect the education sector to follow. The discussion of consequences and directions flowing from the statistical trends cannot be as comprehensive as the title of this paper might suggest. Rather, the reader is invited to review the trends carefully and deduce his or her own conclusions to augment or challenge those presented in the following sections of the paper.

II. Trends and Factors Influencing Public Sector Education

Since this section deals with so many trends and factors influencing public sector education, it may be useful to have a list of the items included. This can serve as a roadmap for the following terrain, as well as a menu of all the factors one would like to include if data and time permitted.

Demographic Trends

- Population
    - Size - birth rates, death rates, natural growth rates
        - net migration: interprovincial and international
    - Composition - by age, sex, ethnic groups and religion
    - Geographic Distribution - urban/rural
        - regional

Sociological Trends

- Family formation and structure - marriage and divorce
    - single parents
    - number of children
- Social problems - crime, violence, addiction, etc.

Economic Trends

- Incomes - total and per capita real growth
    - family incomes
    - distribution
- Inflation
- Labour markets
    - Participation rates
    - Unemployment rates
    - Occupational and industrial distribution
    - Hours of work
- Housing
    - Type of tenure
    - Total housing stock, quality, location

- Technology
    - Communications, information processing

Political Trends

- Political institutions
    - International relations
    - Federal-provincial relations
    - Structure of provincial government
    - Status of municipalities and school boards
    - Status of native people and other minorities
- Values, policies, legislation
    - Multiculturalism
    - Charter of rights
    - Political values

Demographic Trends

Population Size

Trends in vital statistics are widely known and well documented, so may be treated more briefly than their fundamental influence would usually require. The Ontario population (now about 9 million) has doubled in size since 1951, but the growth rate during the period has been uneven. As Table 1 shows, the Ontario population grew at an average annual rate of 3.3 per cent in the early 1950s and at 2.9 per cent in the latter part of the decade. This was the period of the baby boom. Since then, the annual growth rate has declined steadily to about 1 per cent.

Birth Rate. Population growth rates result from the combined effects of birth rates, death rates, and net migration. The birth rate - expressed as the number of births per year per thousand total population - reached a peak in the 1950s and has declined steadily since then to its current level of about 14.2. This crude birth rate, however, is only a rough measure of the trend in childbearing. A better measure is the total fertility rate.

The total fertility rate takes the age-specific birth rate (the number of births per 1000 females in a given age group) to estimate the total number of births that 1,000 females would have during their entire childbearing years. This assumes no mortality and no change in the age-specific rate during those years. This measure has the advantage that the birth rate does not depend on the current age distribution of the population, as does the crude birth rate.

The total fertility rate for Ontario reached a peak of 3.7 during the years 1955 to 1962, and has fallen to 1.6 in the early 1980s. This is less than the "replacement level" of 2.1 children per female that would be required to maintain a constant population through natural increase alone.

Table 1

Annual Rates for Births, Deaths, Net Migration, and Annual Population Growth, Ontario, Selected Years, 1921 to 1983

Year	Crude Birth Rate[1]	Crude Death Rate[1]	Rate of Natural Increase[2]	Average Net Migration Rate[3]	Average Annual Population Growth Rate[4]	Total Population
					per cent	thousands
1921	25.3	11.8	13.5	..	1.6	2,934
1931	20.2	10.4	9.8	4.9	1.7	3,432
1941	19.1	10.4	8.7	2.1	1.0	3,788
1951	25.0	9.6	15.4	7.3	2.0	4,598
1956	26.6	8.7	17.8	15.0	3.3	5,405
1961	25.3	8.2	17.1	10.3	2.9	6,236
1966	19.0	7.8	11.2	7.2	2.2	6,961
1971	16.9	7.4	9.6	10.4	2.0	7,703
1976	14.8	7.3	7.5	7.0	1.4	8,265
1981	14.2	7.3	6.9	1.3	0.9	8,625
1982	14.3	7.3	7.0	3.6	1.1	8,716
1983	14.2	7.2	7.0	4.6	1.1	8,816

Notes:
1. Number annually per thousand population
2. Birth rate minus death rate.
3. Average annual net number of migrants (international and interprovincial) per thousand population, during preceding period.
4. Average annual growth rate during preceding period.

Source: Ontario Statistics, 1984, Tables 3.1, 3.2, 3.25, 3.27, 3.43.

The dramatic change that has occurred in this short period from 1960 to 1980 has been explained by demographers. The baby boom was due to three factors:

> First, there was an increase in the family size, that is the number of offspring per woman. Second, there was a tendency to bear children at increasingly younger ages and at shorter intervals. Third, there was an element of making up for delays in childbearing caused by the war.[3]

In contrast, the current low rates relate to women who are still in their childbearing years so only tentative explanations can be offered:

> First, these women are having fewer children and second, they are having them later in life and at longer intervals. As a result, their fertility rates are down sharply. Some of these may have merely been postponing births, and if they do in fact "catch up" later on, the completed fertility rate could be somewhat higher...[4]

Early evidence that a higher rate may in fact be developing comes from preliminary findings of a national fertility study based on an interview survey of Canadian women.[5] This showed that the average number of children that Canadian women now expect to have is 2.3. Offsetting this effect, however, is a declining number of females under age 25, so one may expect the annual number of births to decline for some time.

Death Rate. The crude death rate - the annual number of deaths per thousand population - declined substantially (from 9.6 to 7.4) during the 1950s and 1960s, but has changed very little since. This measure is also biased by the population's age-distribution: an increasing proportion of young people can result in a lower crude death rate even though the age-specific death rate is increasing. A more accurate measure of changes in mortality are the life expectancies for various age groups. These are shown in Table 2.

Table 2

Average Life Expectancy, by Selected Ages, Ontario
Selected Years, 1931 to 1981

Year	At Age	Females Birth	Females 20	Females 40	Males Birth	Males 20	Males 40
1931		63.9	50.1	32.9	61.3	48.8	31.6
1941		68.4	52.4	34.1	64.6	49.6	31.5
1951		71.9	54.8	35.8	66.9	50.6	32.0
1961		74.4	56.5	37.3	68.3	51.0	32.4
1971		76.8	58.4	39.1	68.6	51.6	32.9
1981		79.0	60.0	40.6	72.3	53.6	34.7

Source: Ontario Statistics, 1984, Table 3.41.

Females born in Ontario in 1981 could look forward to 79 years; this was a gain of about 7 years over the past three decades. Both the current life expectancy and the gain since 1951 were greater for females than for males, but males made greater gains during the last decade.

During the middle decades of this century, the major gains in life expectancy were due mainly to a reduction in infant mortality. Very recently, however, the greatest change has been for those over 50 years of age. Further improvements for these groups will depend on medical advances in dealing with cancer and cardiovascular diseases, and reductions in deaths due to traffic accidents.

Natural Increase. The number of births minus deaths per thousand population provides the rate of natural increase. This rate, together with net migration, determines the total population increase. Natural increase has had the stronger impact on population in Ontario for every period but 1966 to 1971.

Net Migration Rate. The net migration rate - calculated as the annual net number of persons coming into the province per thousand population - combines the effect of four different migration flows. These are the immigration of persons into Ontario from other countries and from other provinces, and the emigration from Ontario to both destinations. Similarly, four different sets of reasons could prevail at any time to explain these flows.

Net international migration has made a much stronger contribution to Ontario's population growth in every period except the 1930s.[6] During the 1970s, Ontario had a net outflow of population to the other provinces that was barely offset by the net inflow from other countries. (See Table 1.)

Immigration to Canada is a matter of federal government policy. This varies from year to year with changes in economic and political conditions. The projected levels of immigration for the near future have been reduced in view of the high unemployment rates and the recent economic recession and slow recovery. Emigration from Ontario, both to other provinces and other countries, has resulted almost entirely from more favourable economic conditions elsewhere. Engineers, nurses, and physicians have periodically emigrated to the United States, and accountants and engineers were recently attracted to the western provinces, all in pursuit of higher real incomes and better working conditions. More restrictive immigration policies in the United States and economic recession in western Canada likely will continue to reduce the emigration rate.

Proposals for an expansionary national immigration policy have emerged in recent years in response to the declining fertility rate. A concern that the aging population will also be shrinking in size, suggests that more immigration will be necessary to maintain Canada's economic vitality. The current adverse economic conditions are likely, however, to weigh against the longer run view and thus will postpone any significant increase in immigration.

Composition of the Population

The changing composition of the population, in terms of age, sex, and ethnic origins, usually has stronger and more abrupt influences on social and economic conditions than the total size of the population.

Age Distribution. The changing age structure of the Ontario population is seen in Table 3. The youngest age groups (0-14 years) constituted about one-third of the total population from 1956 to 1966 but now are about one-fifth of the total. During the past few years, however, the number of pre-school children has increased as the baby-boom females moved into the childbearing years. This increase will dampen the decline in the school-age population.

The adult population (20-64 years) - from which most of the labour force is drawn - fell from 59 per cent to 45 per cent over the 1941 to 1971 period, but rebounded to 59 per cent again by 1981. The group of 65 years and over has become proportionately more important almost steadily through at least the past sixty years, until they now are over 10 percent of the population.

Dependency Ratio. Another common measure of the population's age structure, with obvious economic implications, is the dependency ratio. This is the ratio of the number of persons aged 0-14 and over 65 years to those in the group aged 15-64 years. Such a ratio can be calculated using the data from Table 3. These indicate that the dependency ratio peaked about 1971, with a ratio of almost 8 dependents (young and old) for every 10 active adults (aged 15-64 years). By 1981 this had fallen sharply to a ratio of 4.7. This appears to be the lowest level for the ratio, at least since 1921; and the decline can be expected to continue as the young dependent group (0-14 years) represents a decreasing proportion.

Table 3

Population Distribution by Age Groups, Ontario, Selected Years, 1931 to 1983

Year	Age: 0-4	5-9	10-14	15-19	20-64	65 and over	Total
			percentage				thousands
1921	10.3	10.5	9.4	8.7	55.4	5.9	2,934
1931	9.0	9.7	9.3	9.3	55.9	6.8	3,432
1941	7.9	8.0	8.6	9.0	58.5	8.0	3,788
1951	11.2	8.7	7.1	6.9	57.3	8.7	4,598
1956	11.6	10.4	7.9	6.4	55.3	8.4	5,405
1961	11.9	10.8	9.5	7.0	52.7	8.1	6,236
1966	10.7	11.1	9.9	8.6	51.5	8.2	6,961
1971	10.2	12.6	12.6	11.4	44.8	8.4	7,703
1976	7.4	8.1	9.7	9.8	56.1	8.9	8,265
1981	6.9	7.2	7.8	9.4	58.6	10.1	8,625
1983	6.9	6.9	7.5	8.6	59.7	10.4	8,816

Source: Ontario Statistics, 1984, Table 3.6.

Place of Birth. Table 4 shows that native Ontarians still constitute the largest part of the population, but this group has dropped from 73 to 66 per cent of the total since 1951. This shift was partly offset by an increasing fraction who were born in other Canadian provinces. The European-born population has dropped from 20 per cent in 1961 to 16 per cent in 1981. While the total numbers are still small, those born outside North America or Europe rose from less than one per cent to seven per cent over the past two decades.

Ethnic Origin and Mother Tongue. The trends in birthplace of the population obviously will have parallels in the ethnic origins. Those of British and/or French origin declined from three-quarters of the population in 1951 to two-thirds by 1981. Other European origins increased more than proportionately during the high-immigration periods of the 1950s and 1960s, but now represent about one-fifth of the total. All other origins, including native peoples, rose from 3 per cent to 14 per cent over the years 1951 to 1981.

The distribution of the population by mother tongue for 1981 was, as percentages of the total: English, 77; French, 6; other European, 14; Asian and African, 3.

Religion. Trends in religious affiliation stand out sharply. In 1951, the Anglican and United Church adherents made up one-half of the Ontario population. By 1981, their fraction had dropped to one-third, while the Roman Catholic church increased from 25 per cent to 35 per cent. The other religious and "no religious preference" group increased from 7 per cent to 16 per cent.

Geographic Distribution

Urbanization. The urbanization trend has likely come to an end. The Ontario population in urban areas rose from 60 per cent in 1951 to over 80 per cent in 1976. With the urban group at 82 per cent of the total in 1981, there is little scope for further change. Rather, there seems to be a temporary

Table 4

Population by Birthplace, Ethnic Origin, and Religion, Ontario Selected Years, 1951 to 1981

Place of Birth	1951	1961	1971	1981
		per cent		
Ontario	72.6	69.0	67.6	66.1
Rest of Canada	8.9	9.3	10.2	10.2
United Kingdom	9.4	8.0	6.7	5.8
Europe	7.0	12.4	11.9	9.8
United States	1.5	1.3	1.3	1.3
Asia	0.2	0.4	1.0	2.8
Caribbean	0.1	0.1	0.6	1.7
Other	0.3	0.3	0.7	2.3
Ethnic Origin				
British[1]	67.0	59.5	59.4	56.6
French[1]	10.4	10.4	9.6	9.7
Italian	1.9	4.4	6.0	5.7
German	4.8	6.4	6.2	4.4
Dutch	2.1	3.1	2.7	2.2
Jewish	1.6	1.0	1.8	1.5
Other European	8.8	11.6	10.2	5.7
Chinese	0.2	0.2	0.5	1.4
Other Asian and African	0.6	0.4	2.0	2.9
North and South America	0.9	0.9	1.3	2.2
Other[1]	1.7	2.1	2.4	7.7
Religion				
Anglican	20.4	17.9	15.8	13.6
Baptist	4.6	4.0	3.7	3.4
Greek Orthodox	1.0	1.3	1.7	1.6
Jewish	1.8	1.7	1.6	1.7
Lutheran	2.9	3.9	3.9	3.0
Presbyterian	9.5	7.9	7.0	6.1
Roman Catholic	24.8	30.0	33.3	35.0
United Church	28.7	26.3	21.8	19.4
Other religion	6.7	7.0	6.7	9.0
No religious preference			4.5	7.2
Total (thousands)	4,598	6,236	7,703	8,534

1. Includes reallocation of 1981 classification "multiple origins".

Source: Statistics Canada, Census of Canada.

instability or disequilibrium as the middle-income population tries to decide whether it prefers the ranch-style houses of traditional suburbs or renovations in the city centres. Younger, newly-married families may choose new townhouses in the extreme suburbs or condominiums downtown, but ultimately are likely to follow the trend set by their predecessors whose choices will determine both the best real estate investments and where municipal services are to be emphasized.

Although the distribution of the total population is unlikely to change significantly, differences in the characteristics of population in each region are likely to be accentuated. Most of the recent immigrants have gone to the metropolitan areas, and especially to Toronto. Since the trend has been toward a lower percentage of immigrants from Europe, current immigration will increase the non-European percentage in the metropolitan areas.

One should also note that while the rural population may not decrease any further, as a fraction of the total, there will be more non-farm residents among the rural population.

Regional Distribution. The Ontario population divides itself roughly in thirds with respect to its regional distribution: about one-third live in the Toronto census metropolitan area (CMA), another third live in the other nine CMAs represented by Hamilton, Kitchener, London, Oshawa, Ottawa, St. Catharines, Sudbury, Thunder Bay, and Windsor; and the final third live elsewhere in the province. There was only a minor shift in regional distribution from 1976 to 1981, with Toronto rising from 34 to 35 per cent of the total; a slight relative increase in Oshawa; and relative decreases in Kitchener, St. Catharines, and Sudbury. One can conclude, however, that for purposes of developing broad public policies there recently has been little change in the regional distribution of the population. More significant changes have occurred within specific CMAs, with differential growth rates in the urban core, the urban fringe, and the rural fringe.[7]

Sociological Trends

Family Formation: Marriage and Divorce Rates

Marriage Rate. The crude marriage rate,defined as the number of marriages each year per thousand population - is shown in Table 5 to have fluctuated considerably, but this is due mainly to the shifting age-structure of the population. Moreover, there is not a clear trend in the actual number of marriages in Ontario. The total number had increased fairly steadily to 1972, was approximately constant for 1972 to 1974, then declined to 1980 - from about 73 thousand to 69 thousand in 1979. With the past few years, the number of marriages has risen again.

These aggregate numbers mask two important trends. When the number of first marriages is related to the single population, the marriage rate for this group is the lowest it has been, at least during this century. But offsetting this effect somewhat is an increasing trend for remarriages. About twenty per cent of the total marriages are now second marriages. This presents an interesting challenge for demographic forecasting. With relatively fewer single people entering into marriage, but more of the previously-married deciding to marry again, what will be the net effect on the birth rate, family structure, and other basic features of the population?

Divorce Rate. The crude divorce rate - the number of divorces per thousand population - is also biased by the age-structure of the population. But the trend is more certain than for marriages. Since the Divorce Act amendments of 1968, the number of divorces in Ontario have increased sharply; in fact the annual number doubled from about 12 thousand in 1971 to about 24 thousand in 1983.

Table 5

Average Age at Marriage, and Marriage and Divorce Rates, Ontario, Selected Years, 1951 to 1981

Year	Average Age at Marriage: Brides	Average Age at Marriage: Grooms	Marriage Rate[1]	Divorce Rate[2]
1951	25.4	28.3	9.8	0.5
1956	25.1	27.9	8.6	0.5
1961	24.9	27.8	7.1	0.4
1966	24.4	27.1	7.8	0.6
1971	25.1	27.6	9.0	1.6
1976	25.6	28.2	8.4	2.2
1981	26.5	29.2	8.1	2.5
1982	26.7	29.4	8.2	2.7

Notes: 1. Number of marriages per 1,000 population
2. Number of divorces per 1,000 population. The Divorce Act (Canada), in force July 1, 1968, broadened the availability of divorce.

Source: Ontario Statistics, 1984, Tables 3.60 and 3.64.

Table 6

Population by Family Structure, Ontario, Selected Years, 1971 to 1981

Family Structure	1971	1976	1981
Population in Families		per cent	
Husband-Wife Families			
With children at home	68.4	65.0	61.5
Without children at home	14.1	16.1	17.5
Single Parent Families	6.6	7.1	8.0
Population not in families	10.9	11.9	13.1
Total population (thousands)	7,548	8,085	8,453

Source: Ontario Statistics, 1984, Table 4.6.

Although this historical trend is clear, it is much less certain what the pattern will be in the future. The amendments making divorce more easily obtained undoubtedly gave legal form to separations that had occurred over many years previously, and may also have led some married couples to choose divorce who would not have done so earlier. This unusual "aftermath" effect must also be seen alongside the decline in the rate of first-marriages. Perhaps the marriages that do occur will be more enduring unions.

The divorce rate should also be disaggregated - when implications for educational planning are involved - according to the number of dependent children of the divorced couple. During the five years 1978 to 1982, almost exactly one-half of the divorces in Ontario were for couples with no dependent children.[8]

Family Structure. During a single decade, from 1971 to 1981, significant trends emerged in the family structure of the population. As shown in Table 6, the population in traditional "husband-wife families" with children at home dropped from 68 per cent to 62 per cent of the total. This shift was due to three other trends. There were increasing fractions of the population living in families without children, in single-parent families, and not living with or in a family.

The increased employment of females, and decreased dependence on children to supplement family incomes, has meant a shift in the role of the family from an economic unit to a recreational unit. Individuals form and maintain family units not so much for economic support, as for emotional and psychological support and recreational activity. Although the increased divorce rate has divided families, this has been largely offset by an increasing remarriage rate, with the rearrangement of children among families.

Several other factors, however, are having more widespread effect on the function of families, and their relationship with the education system. First, married partners are living together for longer periods after their children leave home. This has increased the incidence of the "empty nest" situation, with the aging couple deciding either to maintain a larger home than they require, or to "trade-down" to a smaller, but owner-occupied house. Second, families have fewer children; children are more closely spaced; and the first child is born when the mother has a higher level of education and/or employment experience. Third, children may remain an economic burden at ages 16 to 25, and certainly for a longer period than in the past.

Social Problems

Statistical trends on basic demographic and social phenomena are readily obtained and are fairly reliable measures of the true state of social conditions. Complete and accurate data on many other social trends are, however, not available on a comprehensive, comparable basis over time. For example, it is often argued that illegal activity such as prostitution and drug-trafficking is much over- or underestimated, depending on the self-serving interest of the group producing the estimates. Other activities may simply defy general quantification. There are, however, a few trends that can be identified from standard statistical series for Ontario.

Crime Rates. Trends in criminal offences by various types of crime are shown in Table 7. Numbers of offences are shown as a ratio per thousand population. As for other demographic and social statistics, one would prefer to see these rates on an age-specific basis since the majority of criminal offences are by males 18 to 40 years of age. Nonetheless, some clear trends are apparent. There was a significant increase in the violent crime rate from 1972 to 1980,

Table 7

Crime Rate: Actual Offences, by Major Categories, Ontario, 1972 to 1982

	Criminal Code						
	Violent Crime	Property Crime	Other Crimes	Federal Statutes	Provincial Statutes	Municipal By-Laws	Total Population
		Number of offences per 1,000 population					thousands
1972	5.6	39.1	14.1	2.2	16.4	2.2	7,809
1974	5.8	42.2	19.0	4.7	19.7	2.6	8,054
1976	6.2	46.8	21.1	4.7	15.6	2.7	8,265
1978	6.2	49.1	22.9	5.2	17.4	1.8	8,440
1980	6.5	56.4	25.3	4.9	20.8	2.4	8,570
1982	6.0	57.5	23.6	4.0	21.7	2.8	8,716

Source: Ontario Statistics, 1984, Table 32.5.

but a slight decrease in 1982. (There was also a decrease in 1977 that does not appear in this alternate-years series.) During the decade, there was an increase of about 50 per cent in the property crime rate. This includes robbery, breaking and entering, and theft. Other crimes under the Criminal Code increased by even more than 50 per cent to 1980 but have declined slightly since then.

Offences under the federal statutes - mainly concerning drugs - increased at about the same rate as property crime. There were also overall increases, but with some cyclical pattern, in the offence rate for provincial statutes and municipal by-laws.

Whenever one examines crime rates, there is always the question whether increasing rates represent an increase in the actual commitment of offences, or whether crime detection has been more effective, or both. The substantial increases in Criminal Code offences in such a short period, however, would seem to show unequivocally an increase in the actual crime rate.

Economic Trends

Incomes

Income per capita. There are alternative measures of the total economic output or income for the provincial economy. The gross provincial expenditure (GPE) presented in Table 8 closely resembles the national measure, GNE, which is often cited for income comparisons. The GPE at current market prices is adjusted for inflation and population growth to determine the trend in real GPE per capita. This shows the pronounced cyclical behaviour of the economy during the past decade; strong growth in 1972-1973, modest recoveries in the late 1970s, but recessions in 1975, 1980, and especially in 1982.

Table 8

Gross Provincial Expenditure, and Family Income Ontario, 1971 to 1982

Year	G.P.E. at Market Prices	G.P.E. in constant (1971) prices[1]	Constant G.P.E. per capita	Annual Increase in G.P.E. per capita	Median Family Income	Family Income in 1981 prices[2]	Annual Increase in Family Income
	$billions			per cent			per cent
1971	38.9	38.9	$5,052	-	$10,546	$ 24,814	-
1972	43.6	41.5	5,321	5.3	11,425	25,616	3.2
1973	50.4	44.0	5,570	4.7	12,817	26,647	4.0
1974	59.2	44.9	5,575	0.1	14,980	28,157	5.7
1975	64.8	44.3	5,421	-2.8	16,588	28,163	0.0
1976	74.5	46.4	5,615	3.6	18,115	28,663	1.8
1977	82.0	47.6	5,699	1.5	19,847	29,144	1.7
1978	89.7	48.8	5,783	1.5	21,639	29,602	1.6
1979	100.9	49.8	5,859	1.3	23,688	29,353	-0.8
1980	111.6	49.6	5,786	-1.2	26,906	30,265	3.1
1981	127.1	51.0	5,930	2.5	29,669	29,669	-2.0
1982	133.2	48.6	5,576	-6.0			

1. The Gross National Expenditure implicit price index is used to adjust for constant G.P.E.

2. The Toronto Consumer Price Index is used to adjust for constant income.

Source: Ontario Statistics, 1984, Tables 10.2 and 7.8

Family Incomes. From the annual survey of consumer finances one can obtain data on family incomes. This measure includes personal transfer payments such as unemployment insurance payments, and excludes the non-personal income components of national income accounting measures. In this way it presents a more valid picture of the average family's economic means. This trend is generally similar to the GPE trend, but the fluctuations tend to be less extreme. The overall increase for the decade was slightly greater for family income than for real GPE per capita. (See Table 8.)

Income Distribution. Family and personal incomes have increased, but at the same time there has been virtually no change in the personal distribution of incomes.[9] The families in the lowest income quintile (or one-fifth of the population) have received about 6 per cent of total family incomes for at least the past 35 years. The second lowest quintile has received about 13 per cent, and the middle quintile has had about 18 per cent. The only significant variation has been within the top two quintiles, or 40 per cent of the population. Here, the fourth quintile has gained slightly from the top quintile during the past two decades.

Inflation. The price indexes displayed in Table 9 show how price levels have changed for four components that have a direct bearing on the education sector. The consumer price index (CPI) is commonly regarded as a measure of changes in the cost-of-living. The high inflation rates of 1974 and 1975, and 1979 to 1982 are well known. Since the CPI is currently increasing at about 4 per cent annually, there is some optimism that those high rates are historic only. The CPI for Toronto is used in Table 9 because the CPI is calculated for Canada and major cities, but not by province.

Table 9

Price Indexes and Annual Inflation Rates for Consumer Goods, Energy, Housing, and Non-residential Construction, Ontario, 1971 to 1984

	Toronto Consumer Prices 1981=100		Canada Energy 1981=100		Toronto Housing 1981=100		Ontario Non-residential Construction 1971=100	
Year	**Index**	**Annual Increase %**	**Index**	**Annual Increase %**	**Index**	**Annual Increase %**	**Index**	**Annual Increase %**
1971	42.5	-	29.1	-	-	-	100.0	-
1972	44.6	4.9	29.9	2.7	-	-	108.8	8.8
1973	48.1	7.8	32.6	9.0	-	-	118.1	8.5
1974	53.2	10.6	37.6	15.3	54.4	-	135.2	14.5
1975	58.9	10.7	42.7	13.6	59.7	9.2	146.6	8.4
1976	63.2	7.3	49.2	15.2	66.0	10.6	161.9	10.4
1977	68.1	7.8	55.2	12.2	71.9	8.9	174.4	7.7
1978	73.1	7.3	60.4	9.4	77.3	7.5	186.4	6.9
1979	80.7	10.4	66.3	9.8	82.6	6.9	207.7	11.4
1980	88.9	10.2	76.9	16.0	89.1	7.9	225.0	8.3
1981	100.0	12.5	100.0	30.0	100.0	12.2	245.6	9.2
1982	111.3	11.3	119.8	19.8	112.9	12.9	267.0	8.7
1983	118.0	6.0			119.8	6.1		
1984	122.8	4.1			123.9	3.4		

Source: Ontario Statistics, 1984, Tables 11.4, 11.6, 11.8, 11.14; and Statistics Canada, Consumer Prices and Price Indexes.

The index of energy prices for Canada shows even stronger fluctuations in the annual increases, and a much greater overall increase since 1971: energy prices increased by more than four times compared with a 2.6 times increase in the CPI. It also shows, however, that oil price increases have been implemented more gradually than popular media reports had suggested.

The index for housing in Toronto measures changes in prices for accommodation, and not the selling prices of residential properties. The components include rental rates and the operation costs incurred by home owners, as well as household furniture and equipment. This index has increased just slightly more than the total CPI.

The cost of non-residential construction in Ontario would also apply to school construction, renovations and major repairs. This index is more difficult to compare with the others because it has not been converted to a 1981 base. Had that been done, it would be seen that the increase since 1971 is almost exactly the same as for the Toronto CPI.

Labour Markets

Labour force participation rates. Possibly the most important labour market trends have been the changes in labour force participation rates (LFPR) by different age and sex groups. The LFPR is the actual number of persons in the labour force (both employed and unemployed) expressed as a percentage of the total population in the specified age or other group. For the youngest group (15-19 years, both males and females) there was a decline in the LFPR from 1956 to 1961 because they were remaining in school longer. This trend was reversed, however, for the next twenty years due to the greater availability of part-time work and unemployment insurance coverage. A very recent decline in their LFPR may have been due to their withdrawal in the 1982-83 recession. For the

Table 10

Labour Force Participation Rates, by Sex and Age, Ontario, Selected Years, 1951 to 1983

	Age Groups					
Males	15-19	20-24	25-44	45-64	65+	Total
1951	-	-	-	-	-	86
1956	50	93	99	94	39	85
1961	39	91	99	94	32	82
1966	45	88	98	94	30	82
1971	44	83	98	92	22	80
1976	53	84	97	87	18	79
1981	62	88	97	88	16	80
1982	58	86	96	87	16	79
1983	57	86	96	86	14	79
1984	59	85	96	84	14	79
Females						
1951	-	-	-	-	-	26
1956	39	52	31	26	6	29
1961	33	50	34	34	7	32
1966	37	57	39	38	6	36
1971	40	61	45	41	6	40
1976	51	70	59	46	5	49
1981	58	76	70	50	6	56
1982	57	76	71	51	5	56
1983	57	77	73	51	4	56
1984	58	78	74	51	4	57

Source: Ontario Statistics, Table 6.5 and Statistics Canada, The Labour Force for 1984 data.

Table 11

Unemployment Rates, Annual Averages, by Sex and Selected Age Groups, Ontario, Selected Years, 1956 to 1984

	15-19 Years		20-24 Years		Total Labour Force	
Year	Males	Females	Males	Females	Males	Females
1956	5.8	-	3.8	-	2.8	1.3
1961	13.2	8.0	9.6	-	6.3	3.2
1966	7.5	6.1	3.6	2.6	2.6	2.3
1971	15.8	11.5	9.2	5.9	5.5	4.8
1976	14.9	14.5	8.9	8.6	5.1	7.8
1977	15.7	15.4	11.1	11.3	5.9	8.6
1978	17.6	16.0	10.3	10.2	6.1	8.8
1979	15.2	14.8	9.2	9.3	5.6	7.8
1980	17.1	14.6	9.7	9.9	6.2	7.7
1981	16.0	14.7	11.4	8.5	6.0	7.4
1982	22.3	17.0	17.7	13.1	9.7	9.8
1983	21.8	17.3	19.3	13.8	10.4	10.3
1984	19.2	15.3	14.5	12.3	8.7	9.6

Source: Ontario Statistics, 1984, Table 12.21, and The Labour Force.

males aged 20 to 24 years and 45 to 64 years, the LFPR declined from 1956 to 1976, and may now be stable at about 85 per cent. The "prime age males" - 25 to 44 years - have maintained a very high participation rate at 96 per cent or more. Those over 65 years have withdrawn from the labour force as pension provisions became more widely available and mandatory retirement clauses came into effect.

The females aged 20 to 64 years have increased their LFPR quite steadily and remarkably since 1956. The LFPR for young females (20 to 24 years) is at 78 per cent and still approaching the LFPR for males of the same age.

Unemployment Rates. The increasing LFPR for the total population has occurred in spite of, but may also have been a cause for, the increasing unemployment rates. For young males and females, Table 11 shows that their unemployment rates have been at 15 to 20 per cent during the past seven or eight years. This is roughly double the rate for the total labour force. Since 1966, as females began to participate so much more actively in the labour force, their unemployment rates have been equal to or greater than the male unemployment rate.

Economic Forecasts. The foregoing economic trends - for incomes, inflation, participation rates, and unemployment rates - define the general pattern of overall economic activity in the province. Forecasts of changes in these measures are based on complex calculations and assumptions that require frequent revision. With this caveat, however, it may be useful to include at this point a forecast of these indicators for the next decade. Table 12 shows that total real growth in the Canadian economy is expected to reach an annual rate of 3.5 per cent by 1989 but to increase more slowly thereafter. Inflation is forecast to increase steadily through the decade but to remain well below the two-digit rates experienced during the past ten years. Unemployment

Table 12

Forecast of Major Economic Indicators for the Canadian Economy, 1985 to 1995

Year	Annual growth in real Gross National Product	Annual increase in Consumer Price Index	Average annual Unemployment Rate	Labour Force Participation Rate
		per cent		
1985	2.8	3.0	10.7	65.2
1987	3.4	3.3	10.1	65.4
1989	3.5	3.8	8.9	66.0
1991	2.2	4.3	9.0	66.3
1993	2.7	4.8	8.8	66.5
1995	2.6	5.5	8.5	66.9

Source: P. Dungan, Outlook for the Canadian economy through 1995, background paper for Centre for Industrial Relations Conference, November 1984.

rates are seen to fall gradually but to remain at rates well above the postwar average. Finally, labour force participation rates continue their gradual increase.

Despite a growing number of annual economic forecasts, there is little variation from the outlook just described. The consensus seems to be that the next decade will bring inflation of 3 to 5 per cent annually; an unemployment rate of about 8 to 12 per cent; real growth of about 2 to 4 per cent annually; and possibly, a gradual improvement in labour productivity. While this is better than the worst of times seen recently, it is far from the best of times. Moreover, there is currently no evidence that the following decade will be very different. When one is that far out into the economic future, however, there is a tendency for hope and optimism to replace econometric models as a basis for forecasts.

Industrial Distribution. There have been two outstanding trends in the industrial distribution of employment in Ontario. These are the decline of the primary and secondary sectors, and the growth of the tertiary or service sector. During the postwar period, agricultural employment dropped from 11 per cent to 3 per cent of the total; manufacturing declined from 33 per cent to 23 per cent; while employment in community, business, and personal service doubled from 14 to 28 per cent. (See Table 13.)

From 1975 to 1983, the service sector - excluding government service - accounted for 320,000 additional jobs or 62 per cent of the addition to Ontario's employment during this period. Moreover, forecasts from the Ontario Manpower Commission show that the service industries will continue to be the major contributors to job openings for at least the next few years.[10]

Table 13

Labour Force by Industry and Occupation, Ontario
Selected Years, 1951 to 1981

Industry	1951	1961	1971	1981
	percent			
Primary	13.6	9.8	5.4	4.4
Agriculture	10.7	7.1	3.9	3.2
Forestry	1.2	0.8	0.3	0.3
Fishing and trapping	0.1	0.1	0.0	0.1
Mines, Quarries, Petroleum	1.6	1.8	1.2	0.9
Secondary	39.4	33.3	30.5	28.6
Manufacturing	32.6	26.9	24.4	23.1
Construction	6.8	6.4	6.1	5.5
Tertiary	46.0	54.9	57.0	63.9
Transportation, communication other utilities	8.4	8.2	6.6	7.0
Trade	14.2	15.5	14.8	16.3
Finance real estate	3.3	4.1	4.6	5.7
Community, business, and personal service	13.9	19.5	23.5	28.1
Public administration and defence	6.2	7.6	7.4	6.8
Unspecified	1.0	2.2	7.1	3.1
Total (thousands)	1,885	2,393	3,354	4,473

Occupation	1971	1981
	percent	
Managerial and administrative	4.7	7.2
Natural sciences, engineering, math.	3.1	3.7
Social Sciences	1.0	1.2
Religion	0.2	0.2
Teaching	3.8	3.9
Medicine & health	3.7	4.1
Artistic, recreatioal	1.0	1.5
Clerical	17.6	19.4
Sales	9.6	9.6
Service	10.6	11.6
Farming	4.3	3.5

Occupation	1971	1981
	percent	
Fishing, hunting	*	*
Forestry	0.4	0.3
Mining, petroleum	0.6	0.4
Processing	3.7	3.7
Machining	3.8	3.3
Fabricating	8.3	8.7
Construction	6.2	5.5
Transport	3.6	3.4
Materials handling	2.5	2.3
Other crafts	1.4	1.3
Others & not stated	10.0	5.0
Total (thousands)	3,354	4,473

*less than 0.1 percent

Source: Statistics Canada, Census of Canada

There is a limit to this relative growth of the service sector, however, since the primary industries would seem to have reached a minimum and could make at best only a negligible transfer to the service sector. Manufacturing has not changed its relative size since 1971; it too is unlikely to shrink further.

Occupational Distribution. Trends in the occupational distribution of the labour force cannot be easily derived because Statistics Canada has used a different occupational classification system for each census. Fortunately, there were only a few changes from 1971 to 1981, and the 1981 occupations have also been classified using the 1971 system. Table 13 shows that the outstanding shifts over the decade were the increases in managerial and administrative groups, in medicine and health, and in clerical jobs.

In employment forecasts, it is easy for readers to confuse industries with the highest rate of growth and those with the largest absolute growth. This point is emphasized by the Economic Council of Canada in its most recent (1984) annual review. The Council shows employment forecasts for the United States, where for the next ten years the largest-growth occupations are expected to include building custodians, secretaries, truck-drivers, sales and office clerks.[11] The highest growth rates will be related to computer analysts, operators, programmers, and technicians, but these new jobs are small in number by comparison with the total labour force.

Hours of Work. The average length of the work week has declined during the past three decades from 44 hours to approximately 38 hours, and now seems headed toward 35 or even 32 hours. The question for current planning of future institutional arrangements is whether the work week will move to 6.5 or 7 hours per day for 5 days, or to 8 or 8.5 hours for 4 days.

Table 14

Dwellings by Type of Tenure, Ontario, Selected Years, 1956 to 1983

Year	Total Dwellings (thousands)	Percentage Owned	Percentage Rented
1956	1,370	73	27
1961	1,630	72	28
1966	1,869	71	29
1971	2,208	67	33
1976	2,606	66	34
1981	2,938	65	35
1982	3,003	64	36
1983	3,078	64	36

Source: Ontario Statistics, 1984, Table 8.8

There is also a minor trend toward flexibility in working hours, particularly in public sector office jobs - but these arrangements are more likely to accommodate existing school patterns rather than to press them for changes.

Housing

Type of Tenure. Home ownership is still more popular than renting accommodation, but as Table 14 shows, the percentage of home-owners has declined steadily. The major drop in the home-ownership group occurred between 1966 and 1971. This may have been due mainly to the sharp increase in housing prices that occurred in Ontario's metropolitan areas between 1965 and 1969.

Technology

Changes in technology seem to attract more publicity and inspire more dramatic forecasts than changes in demographic, social, and economic conditions.

Whether the changes be in the area of research and discovery, or development and application, one would like to have a consistent, objective time series to show the pace of change in broad areas of technology. Currently it is not possible to make general statements about the rate of technological change.

Data by which one can construct annual statistical series on basic technological developments in the Ontario economy are either non-existent or are so disaggregated that considerable effort is required to construct a general indicator. For example, there are time series on the value of computer sales, number of organic transplants, telephones per person, and so on, but these need to be aggregated to provide an overall perspective on technological trends. The one available aggregative series - the capital/labour ratio - uses a measure of the capital stock per worker that combines various approaches to estimating the value of plant and equipment and does not necessarily measure changes in technology. Other apparently broad and objective measures raise many more questions. For example, statements that assert the half-life of technical knowledge is less than ten years may make the point that advances to knowledge are occurring faster than a few decades ago, but they do not offer a useful measure of change.

One cannot deal with technological trends in the same way that trends have been treated in the other sectors. Instead, it is necessary to examine the consequences and impacts of each development, such as microcomputers, videotex, genetic engineering, and so on.

Political Trends

Identifying and measuring trends in demography and economics is a relatively simple task. But there are few political trends that can be consistently and continuously quantified to provide an acceptable time series of data.

Voting and Budgetary Trends

One type of trend analysis that is commonly used in political science is an examination of voting patterns over a period of time. In Ontario, the basic trend in voter behaviour has favoured the Conservative party for forty years, notwithstanding some fluctuation in its share of the popular vote. But one can examine the budget patterns of the provincial government to see how it has interpreted its electoral mandate.

The trends in provincial budgetary allocations for the past several years are displayed in Table 15. The percentage of total government expenditure allocated to education (elementary and secondary sectors) has been cut in half since 1971, when it was at 23.6 per cent. There was a brief period in the late 1970s when education's share rose slightly, but otherwise there has been a steady reduction. Whereas education represented almost 40 per cent of social policy expenditure in 1971, it now is only 20 per cent of the total. Meanwhile, health expenditures have increased from 30 per cent of the total in 1971, to 50 per cent now.

The resources development share of the budget dropped from 1971 to 1973 due to reorganization of the municipal affairs ministry, but has remained in the range of 13 to 17 per cent since then. Similarly, justice expenditures have remained at about 3.5 per cent. General government expenditures, however, have been allocated a much larger share - particularly for the treasury and economics ministry.

Table 15

Ontario Government Budgetary Expenditure, by Policy Field, Selected Years, 1971-72 to 1984-85

Year	Education[1]	Social Policy[1]	Resources Policy[2]	Justice Policy[3]	General Government[4]	Total
		per cent				$billions
1971-72	23.6	61.5	23.7	4.0	11.2	5.2
1973-74	19.3	66.4	14.6	3.8	15.3	7.3
1975-76	16.8	63.9	15.8	3.7	16.9	10.6
1977-78	17.9	65.3	13.9	3.6	17.4	13.1
1979-80	16.8	64.2	13.3	3.6	19.2	15.3
1981-82	15.5	63.4	17.2	3.6	15.5	19.7
1983-84	12.4	61.1	16.1	3.7	18.8	25.0
1984-85	12.0	60.8	15.2	3.5	20.5	26.8

1. Education is part of social policy which also includes health, social services, postsecondary education, culture.

2. Includes transportation, housing, natural resources, environment, agriculture, tourism, industry and trade, energy, labour.

3. Includes solicitor general, attorney general, correctional services, consumer and commercial relations.

4. Includes revenue, government services, treasury, northern affairs, intergovernmental affairs (since 1978).

Source: Ontario Statistics, 1984, Table 27.8.

Table 16

Provincial Grants to Elementary and Secondary Schools, as a Percentage of Total School Board Expenditures, Ontario, Selected Years, 1969 to 1983

Year	Elementary	Secondary	Total	Total Expenditures
	per cent			$millions
1969	49.9	41.7	46.5	1461
1971	57.6	55.6	56.8	1784
1973	61.6	59.0	60.5	1999
1975	62.9	58.9	61.3	2656
1977	58.9	49.1	54.9	3407
1979	56.5	46.7	52.5	3919
1981	55.8	46.2	51.9	4793
1983	53.2	42.0	48.8	5947

Source: Education Statistics, Ontario, 1983, Table 8.01

The relative value attached to education at the provincial level can be seen also in Table 16. This shows the provincial grants to schools as a percentage of the total expenditure by boards for elementary (both public and separate) schools and for secondary schools. The provincial share increased substantially in the early 1970s, but has declined since then. Provincial grants now cover about the same fraction of total expenditures that they did in the late 1960s: about one-half for elementary schools and about two-fifths for secondary schools.

One might interpret these trends in the financing of elementary and secondary education as expressing the government's perception that the electorate also has accorded relatively less support for public expenditures on education.

Trends in the Polls

Another approach to identifying political trends is to examine trends in responses to public opinion polls over a number of years. If the polls are based on representative samples of the population and if essentially the same questions are asked each time, one can obtain a measure of changing opinion or attitude. One such analysis of Canadian attitudinal trends was based on polls conducted by experienced polling organizations over the period 1960 to 1978.[12] The authors concluded that responses to certain polls were comparable enough to permit them to identify the following trends - at least up to 1978 - in public attitudes:

1. Economic issues, especially inflation and unemployment had become increasingly important, with the relative importance of either depending on the stage of the economic cycle.
2. There was a growing pessimism about French-English relations, especially among anglophones.

3. There has been "a clear trend" towards a more skeptical view of American-Canadian relations, with increasing support for controls on foreign investment and a modest growth in economic and cultural nationalism.
4. The long-term liberalizing trend with respect to social mores that had been identified since the 1940s seemed to be slowed or reversed in the latter 1970s. But the authors added that the incidence of neo-conservatism in the polls had been modest and uneven. There was also increasing concern for personal security.
5. Although measures of "optimism" were not always comparable or consistent, there seemed to be increasing pessimism in the late 1960s and early 1970s but a return to optimism after 1975.
6. There has been a decline of confidence in government, but such attitudes were not strong enough to be opposed to most government activity. The authors concluded that trust in government in the abstract has declined, but there remains considerable support for concrete examples of government activism.

There are a number of other political trends that seem to be occurring, but one can only describe these in impressionistic terms. Some of these concern changes in the form and use of our political institutions. At the international level, there appears to have been a decline in the development and use of international organizations. In the immediate postwar period, there was considerable enthusiasm and support for organizations such as the United Nations and its specialized agencies. More recently, however, these organizations have played a less important role, as countries revert to bilateral or specialized *ad hoc* multilateral arrangements.

In Canada, the institution of confederation has been severly tested by threats of political separation and increasing financial constraints on both federal and provincial governments. Some observors would suggest that there is a long-run trend toward decentralizing many of the powers exercised by the federal government.

Within Ontario, there appears to be a centralizing tendency with certain powers transferred from municipalities to the provincial government. Similarly, it is argued that school boards have lost many of their most important functions to the municipalities and to the provincial government.

On a different dimension of power, however, there has been a decentralizing trend as governments at each level attempt to provide more rights and opportunities to native peoples and other minority groups.

III. Consequences and Directions for Education

The trends described in the preceding section could impact on the education sector in several of its diverse dimensions. Although the consequences of the trends will be approached in the same order followed in the last section, the discussion is intended to include as many as possible of the following aspects of the education sector:

Quality of education

- Objectives, aims, purposes
- Curriculum content
- Diversity and flexibility vs. uniformity and rigidity

Quantity

- Students - total number and retention rates
- Schools - number, size, location
- Teachers - number, training, organizations

Composition

- Composition of students and teachers populations, by age, sex, ethnic groups
- Geographic distributions

Methodology and technology

- Teaching methods and use of contemporary technology

Administration and control

- Organization and administration of schools, school boards, ministries

Economics and financing

- Costs of instruction, maintenance, construction
- Revenue sources and financing mechanisms

The final impact of the trends discussed here will depend on what society believes schools actually do, and what they ought to do. Whether schools are seen as providing child-care, or job-training, or personal development, will determine the directions that follow from the demographic and economic trends. This has not been the case for several decades; certainly not since the 1920s. The 1930s and 1940s were years of coping with economic depression, war, and their aftermath; the 1950s were years to respond instantaneously to unexpected growth; the 1960s compounded growth with demands for instant and untested reform; the 1970s brought unexpected financial constraints, and unprecedented economic instability. If the demographic and economic forecasts are even roughly correct, the next decade offers opportunities for more deliberate change as well as continuity of the system's proven strengths.

Changes in the educational system occur more gradually than in most other sectors of our socio-economic environment. The market system responds to changes in relative wages and prices; the health care system responds to changes in diagnostic and therapeutic techniques; the political system responds to changes in voting patterns; but other systems such as education, law, social welfare, and defense have no clear signalling device and consequently change more slowly.

Elementary and secondary education is affected by and in turn has its effects on so many groups in society that it possibly is the social sector least susceptible to significant, permanent changes. Parents, teachers, administrators, politicians, employers, taxpayers, and students themselves all can become instant-experts on educational reform. Superficial changes may occur in response to current fads, but these are seldom enduring. The popular metaphor of attempting to alter the course for a fully-loaded ocean supertanker proceeding at full speed is aptly applied to the Ontario education system.

One may object that there were major curriculum reforms at all levels of education in the 1970s, coupled with decentralized and democratized authority, but already these changes are being reversed. The "departmental" Grade 13 examinations that gave way to local school examinations will inevitably reappear in the form of external achievement tests; undergraduate "cafeteria" course-selection is giving way to structured course requirements resembling the old "honours" courses; student apathy has replaced student parity; and so on. The consequences following from the trends described previously will therefore be mainly quantitative, but this should suggest only that the education sector faces gradual evolution rather than abrupt reform.

Demographic Changes

Declining Enrolments

The effect of declining birth rates on school enrolments is shown in Table 17. Elementary enrolments have declined since 1971 and are projected to continue this decline until 1990 or 1991. Secondary enrolments began to decline in 1978 and are expected to do so at least for the next decade.

Pupil/teacher ratios - shown in Table 18 - had dropped substantially even when enrolments were continuing to rise in both elementary and secondary schools. This reflected the increasing financial support for education that characterized the 1950s and 1960s. Reductions in the pupil/teacher ratio since enrolments began their decline have been much less significant. The real costs per student (that is, when adjusted for inflation) increased by 46 per cent in elementary schools and by only 16 per cent in secondary schools during the period 1971 to 1982.

Implications and opportunities following from declining school enrolments have been thoroughly examined by R.W.B. Jackson in his report on this subject and the Ministry of Education response to his recommendations.[13] The major policy issue emerging from this trend and the report was - and continues to be - the opportunity to choose a lower student-teacher ratio, or a reduction in the

Table 17

Enrolment in Public and Private Schools, Ontario, Selected Years, 1971 to 1982, and Projections for Enrolments to 1992

	Elementary			Secondary		
Year	Public and Separate	Private	Private as % of Total	Public	Private	Private as % of Total
	thousands			thousands		
1971-72	1457	20.8	1.4	575	23.2	4.0
1976-77	1360	25.7	1.9	613	33.0	5.4
1977-78	1330	26.4	2.0	614	34.8	5.7
1978-79	1290	27.5	2.1	612	36.6	6.0
1979-80	1259	29.0	2.3	600	38.9	6.5
1980-81	1239	31.2	2.5	586	43.1	7.4
1981-82	1225	33.2	2.7	569	46.0	8.1
1982-83	1217	35.3	2.9	562	46.1	8.2

Projected Enrolments in Public Schools

	Elementary	Secondary
	thousands	thousands
1985-86	1,174	541
1986-87	1,166	534
1987-88	1,161	525
1988-89	1,159	511
1989-90	1,157	504
1990-91	1,158	494
1991-92	1,158	489
1992-93	1,162	483

Note: The methodology for these projections appears to assume a constant rather than increasing proportion of the school-age children will be enrolled in private schools.

Source: Ontario Statistics, 1984, Table 31.6; and Ontario Ministry of Education, Ontario Elementary and Secondary School Enrolment Projections, 1983-1992, Tables 3 and 4.

Table 18

Pupil/Teacher Ratios, and Costs per Pupil, Elementary and Secondary Schools, Ontario, Selected Years, 1956 to 1982

	Pupil/teacher ratio		Real costs per pupil[1]	
Year	Elementary	Secondary	Elementary	Secondary
1956	31.1	23.1	-	-
1961	30.5	23.3	-	-
1966	28.6	18.0	-	-
1971	25.0	16.7	$1779	$3066
1976	23.5	17.3	2267	3366
1981	23.2	17.1	2512	3476
1982	23.0	17.2	2606	3566

1. Current costs are adjusted for inflation using the Toronto Consumer Price Index, 1981=100.

Sources: Education Statistics, Ontario, 1983, Tables 4.141 and 4.151 for ratios and Table 1.35 for costs.

number of teachers with the ratio held constant. Each choice would increase the cost per student. The first obviously requires more teaching resources per student; the second alternative would likely result in dismissal of the youngest, low-salaried teachers, entailing an increase in the average salary.

Declining enrolments also support increasing centralization or regionalization of school boards because larger boards can move teachers and physical facilities within their jurisdictions to make the most effective use of resources, rather than dismissing or disposing of unneeded staff and capacity. This argument would also apply in an expansionary period, but under those conditions, even the smallest boards are expanding and there is no evident need to rationalize resources still further within a region.

Declining significance of local school boundaries, as students are permitted to attend schools elsewhere, will add support for regional boards.

Aging Population

With an aging population there is a smaller percentage of the population with children in school and consequently a proportionately smaller group who are in direct contact with, and generally in support of improved resources for the education system.

An aging and more-educated population will also require that the education sector serve a wider range of ages. Although the introduction of the CAATs and more universities in the late 1960s substantially augmented - or even replaced - the local "night school" programs, the latter have rebounded as the older population looks for recreational classes in convenient locations.

The major consequence, however, of an aging population will be the increasing demands on public financial support for health care, senior citizen housing, industrial research and development programs, and so on. This squeeze on resources for the education sector was portrayed in the preceding section on trends in political values.

Ethnic Composition

With increasing diversity in the total, racial, ethnic, and social composition of the population, together with geographic concentration of some ethnic groups, the schools will encounter more difficulty in maintaining a cultural mix that resembles the total population. This will be an increasing problem as students are permitted to cross local school boundaries to attend schools elsewhere, thereby reinforcing cultural concentrations. While the cross-boundary effect may lead to more and stronger regional boards, the cultural concentration effect would support the case for smaller, local boards that are more familiar with local circumstances.

The declining immigration both from other provinces and other countries has reduced the number of immigrant students admitted to Ontario schools. Data for immigrant students at the secondary level are confused by the inclusion of those on student visas, but the pattern for elementary students clearly shows a large reduction during the past five years.[14]

The shift in religious affiliations of the population has already had its most important effect. As the Roman Catholic population increased from 25 to 35 per cent of the total (and will soon equal the combined number of Anglican, Presbyterian, and United Church adherents) there has been a shift in the relative size of the public and separate school systems, together with the recent decision to provide public financial support to the entire separate secondary school system.

Urbanization

While urbanization seems to have peaked, its effects will continue to develop. Dense, heterogeneous population settlements tend to reduce parental and social control of children, and to enhance the influence of peer-groups. Similarly, there is an increase in crimes and vandalism. Other environmental issues arise for schools in congested areas. Students can be subjected to the hazards of in-school theft, drug-peddling, traffic accidents, and problems associated with industrial pollution and waste disposal.

The true opportunity cost of land zoned for school use also increases with increasing urban development. One should expect continuing proposals for mixed-use development of school sites, with developers possibly offering "free" school accommodation in exchange for opportunities to develop the location for residential and commercial use.

Social Changes

Family Structures

As a greater number of reconstituted and augmented families are formed by increasing divorces and remarriages, there will be different - if not more - emotional pressures on children. While the increasing divorce rate has imposed on children the problems of becoming part of a divided, single-parent family, the emerging trend toward remarriage compounds this with the difficulties of integrating into another family.

These problems will be exhibited in the school context, and will likely require greater skill by teachers in coping with the changes. Schools may be pressed to provide assistance of various kinds to help children who are passing through family changes.

Crime Rates

Increases in the incidence of violent crimes, property damage and theft, and drug-trafficking, have a number of consequences for education. Most important, are the direct, immediate effects on students themselves: vandalism and drug-pushing in schools, and violence at home and in the media have an obvious damaging effect on children and alter their relationships with schools and society. In addition, the increasing costs for policing and justice draw potential public expenditures away from the education sector.

Economic Changes

Incomes

The 1960s expectation of an ever-increasing income has been tempered, and consequently society is less inclined to support increased government expenditures unless they are directly attributable to the family's benefit. The popular support in the 1960s for public expenditures on education was related both to the contemporary belief in a high pay off to investment in education and to the rapid rise in personal incomes, which permitted a growing share of public spending for education.

Family incomes have continued to grow in real terms, due in large part to the increasing participation of women in the labour force. Once the participation rate for married women reaches its peak, family income growth can then occur only through the increasing income of each partner. By that time one may expect an even more restrictive attitude to public spending for social programs.

Inflation

The effects of high inflation rates in the past decade are so pervasive in the economy that one can identify only a few of the major consequences for education. The quadrupling of energy prices has an obvious, direct effect on school operating costs for heating and lighting. Sharp increases in the consumer price index have been the main argument for increasing teachers' salaries. Since there is little scope for improving productivity in the education sector (as is the case for the rest of the labour-intensive service sector) the salary increases can only lead to rising real costs per student. This was shown in Table 18.

Labour Force Participation Rates

What is probably the most important trend to have affected education in the past thirty years has been the near-revolution in the economic role of women. Two features stand out: the decline in the fertility rate, and the increase in labour force participation by married women. The first was the cause for lower enrolments after two decades of rapid growth, while the second led to permanent changes in the occupational patterns, attitudes toward schooling, and organization of both home and school calendars. Table 19 shows that the participation rate for married women has increased so remarkably that since 1980 it is virtually at the same rate shown for unmarried women.

Associated with these changes are secondary shifts that will have reinforcing effects. The average age for first marriage is rising, as women take more time for their formal education or for employment experience prior to marriage. This will given them a greater appreciation for the content and effect of further education, which will in turn be passed on to their children, and which may sharpen their interest and involvement in deliberations on educational reform. Later marriage together with more education and employment experience should also provide greater financial and psychological security as a basis for marriage, resulting eventually in a declining divorce rate, a lower proportion of single-parent families, and possibly less geographic mobility of school-children - as their parents attempt to reconcile employment opportunities for two partners in one geographic area.

With increasing female participation in the labour force, the day-time responsibility for young children - whether viewed as day-care or early childhoood education - will be seen as a public responsibility. There is de facto logic that extends the school system downward through kindergarten, to junior kindergarten, and nursery school. Indeed, there is no obvious age at which formal education should begin. One could see state support beginning at birth, just as readily as at age 6, notwithstanding physiological attention to breast-feeding and diaper-changing.

The growing significance of day-care facilities can be seen in both Tables 19 and 20. The participation rate for women whose youngest child is below age 6 has risen by about 50 per cent in the past ten years and is now roughly the same as the rate for all married women. This has sharply increased enrolments in day nurseries. Table 20 shows, for example, an increase of 30 per cent in the four years from 1979 to 1983. The majority of children enrolled are aged 2.5 to 3 years. These data, however, greatly underestimate the actual use of day-care facilities because the data are only for registered day nurseries. Many children are left in a variety of facilities or homes, including informal neighbourhood cooperatives and the homes or apartments of women who are full-time baby-sitters.

Greater numbers of mothers (or both parents) in the labour force does reinforce the role of schools as child-care centres while the parents are at work. This suggests that school boards will be more vulnerable to teachers strikes. Working parents who view the school system as inexpensive and reliable child care will press school boards to grant reasonable salary increases to avoid interruption in the school programs.

Table 19

Labour Force Participation Rates, Females, by Marital Status and by Age of Youngest Child, Ontario, 1966 to 1983

Year	Not Married	Married	Age of Youngest Child (Years)			
		(per cent)	Under 3	3-5	6-15	Total
1966	45	32				
1971	46	37				
1972	46	38				
1973	47	40				
1974	48	42				
1975	52	47	37	46	55	48
1976	52	48	41	46	56	49
1977	52	49	39	47	58	51
1978	53	51	43	51	61	54
1979	55	52	45	55	62	56
1980	56	54	48	56	64	58
1981	57	55	50	58	67	60
1982	56	56	52	60	68	61
1983	57	56	53	62	69	63

Source: Ontario Statistics, 1984, Tables 5.39 and 6.7

Table 20

Day Nurseries, Capacity and Enrolment, Ontario, 1979 to 1983

		Enrolment by Age Group (Months)				Percentage of Total Child Populatio
Year	Facilities	1-30	30-36	Over 36	Total	(0-9 Years)
			per cent of total			
1979	1509	6.1	70.1	23.8	63,790	5.1
1980	1625	5.7	60.2	34.1	69,518	5.7
1981	1750	5.6	57.3	37.1	76,320	6.3
1982	1877	5.2	59.5	35.3	81,768	6.8
1983	1943	4.8	57.4	37.8	83,443	6.9

Source: Ontario Statistics, 1984, Tables 5.40 and 5.41

Unemployment Rates

High unemployment levels bear most heavily on young people. This increases the school retention rate because forgone earnings are reduced by the high unemployment. There may also be a stronger message that remaining in school enhances future employment opportunities, but this effect can be dimmed somewhat if young people observe increasing unemployment of older, more educated members of the labour force.

Rising youth unemployment has also increased the number of school re-entrants; that is, persons who re-enter the secondary school system after officially withdrawing. Clearly, there are many reasons for this, but a major one is that students leave school to find employment but are unsuccessful and decide to return to school. The total number of re-entrants currently constitute about 5 per cent of the secondary school enrolments, but their number more than doubled between 1976 and 1982 while the secondary enrolment dropped by 8 per cent. One remarkable aspect of the re-entry trend has been that female students returning to school have outnumbered the male students since 1980, even though the unemployment rate was greater for young males than for young females.

Changes in Industrial and Occupational Employment

The shifts in industrial and occupational employment away from semi-skilled, manual jobs in manufacturing and construction toward managerial professional, and clerical skills in the service industries have been a major factor increasing the retention rate for secondary schools and the participation rate in postsecondary education. Not only are students remaining in school longer, but they are also looking for courses and programs that are likely to lead to the best employment opportunities. There has been a strong shift toward the commerce and business administration programs in Ontario universities and in the business courses at the colleges of applied arts and technology.[15] This in turn is reflected in students' preferences for courses in secondary schools.

Hours of Work

A further decline in the length of the work week could exert strong pressure for a change in the standard school day or week. A reduction in working hours that is accommodated by a 9 to 4 work day would have little, if any, effect. But a four-day week with an 8 to 5 or 8 to 5:30 day would likely lead to proposals for a similar structure for the school day and week.

Housing

Changes in the type and tenure of newly-constructed housing can have significant consequences for the education system. The location, quality, size, and financing of new housing will influence who uses the housing, and in turn the number and nature of the children to be schooled.

Political Changes

Budget Allocations

A declining share of the provincial budget allocated to education has put pressure on local school boards to raise additional revenues through the property tax. This was noted in the increasing share of school expenditures derived from this source since the mid-1970s. Consequently, local property-owners become more sensitive to uneven assessments as well as to the increasing tax burden. Furthermore, an increasing proportion of these taxpayers have children who are past school-age and thus are less supportive of local assessments for school expenditures. Finally, teachers associations can organize political action against the central, provincial government much more effectively than against so many local boards and municipalities. The decreasing provincial share provides the argument needed for such a campaign.

Public Attitudes

Consequences of the trends observed in the public polls are obviously numerous and widespread in their impact.

The high level of concern about economic issues means that there will be a continuing desire to see the education system serve the labour market, with a close fit between formal training and required job skills.

A pessimistic view of French-English relationships within Canada could have ambivalent consequences, with some parents pressing harder for French-language instruction, while others despair or become antagonistic toward this budgetary priority.

Growing support for Canadian nationalism would have obvious consequences for the curriculum, with more emphasis on Canadian subjects and orientation in history, geography, and literature.

The ambiguous trends in liberal/conservative attitudes on social mores will have a similarly ambiguous impact on schools. Curriculum, discipline, and authority will be under continuing review, with considerable diversity in actual practices.

Changes in the general level of optimism/pessimism and confidence in government will always fascinate pollsters, journalists, and political analysts, but the consequences of these changes are virtually impossible to identify in a specific and convincing manner.

Political Institutions

Changes in our political institutions usually do have quite significant consequences for the education system. But to speak in terms of trends, rather than occasional changes in these structure, requires detailed analysis of each institution in question and then an examination of its implications for other sectors.

Perhaps the most important political institution affecting education in Canada and in Ontario is the Constitution Act (formerly the British North America Act), since it determines responsibility for the entire substance and financing of education. Trends and consequences relating to this Act are found in the history of federal-provincial and French-English relations during the past twelve decades and will also be seen in the future in the interpretations and applications flowing from the new Charter of Rights.

Possible Directions

The final directive in the terms of reference for this paper was to "estimate possible directions of public sector education", following from the trends, impacts, and consequences that were described earlier. This final part of the paper is organized around the topics listed at the beginning of this section, to show directions for specific aspects of the education system rather than, as before, consequences from specific trends.

When one speaks of "possible directions" it assumes the possibility of continuing in old directions, as well as striking off in new directions. Indeed, it seems very likely that Ontario's public sector education will continue in many of the same, successful directions it has followed in the past, if only because it has done so for the past century despite more disruptive changes and trends than confront it currently. There is a tendency in the planning and forecasting literature to dramatize and exaggerate the rate and importance of change and to suggest that the future will be very different from the past. One example of this is in the Ministry of Education response to the (Jackson) report on declining enrolments. It states

> Another reality we must come to terms with is that a stable social and cultural environment is largely a thing of the past. Statistics indicate that such key characteristics of the social environment as rural-urban transition, home ownership, crime rate, family structure, and ethnocultural composition are constantly changing, in some cases at a bewilderingly rapid pace.[16]

The past could hardly be described as a "stable social and cultural environment" when one considers the large flows of immigrants from Eastern Europe into a province almost entirely British; the social disruption of depression in the 1930s with its high unemployment and low birth rates; the arrival of "war-brides" and the baby-boom following 1945; and the student, cultural, and racial revolutions of the 1960s. The present and the foreseeable future seem too peaceful by comparison.

The tendency to understate past changes and overstate likely future changes is accompanied by an exaggeration of the rate of change in basic social and economic conditions. The above quotation mentions many of the trends that are included in this paper, but none of them could be described as occurring at a "bewilderingly rapid pace". Indeed, the trends were presented quantitatively in this paper because readers of futures studies should have an opportunity to form their own views on how quickly or slowly change is occurring and how significant any change is in the total context. Perhaps the most significant, and sustained change observed in this paper concerns women's labour force participation rates but even this important socio-economic phenomenon has not been at a "bewildering" pace.

With this perspective on forecasting in mind, one can proceed to suggest how public sector education may be pressed to respond to the foregoing trends. It should be recalled that these are "possible directions" and that terms such as "likely" and "might" and "may" are implicit in what otherwise appear as definitive, unqualified pronouncements.

Quality, Purpose and Curriculum

1. With an increasing share of slowly rising incomes going to public expenditures, there will be an increasing concern about the effectiveness of educational expenditures. This will require more definition and measurement of education's output, rather than its input. But this in turn requires a better definition of and consensus on the aims or objectives of education. The Ministry's statement of goals for education[17] includes thirteen goals; or more correctly, it states that the single goal is to help each student develop in thirteen different dimensions. Most of these could not be quantified for an individual, let alone for the thousands of students in the education system. They include reference to resourcefulness, satisfaction, feeling of self-worth, and responsibility. While there would be almost universal agreement with the complete list of goals, there is unlikely to be any agreement on how they should be ranked, or how progress might be measured.

Whatever the problems in definition, ranking, and measuring, there will be more efforts to measure the effects of education. One major component of this will be external testing of senior secondary school students. This will follow, however, not only from a concern for expenditure effectiveness but also for equitable assessment of students who face increasing competition to enter postsecondary institutions.

2. There will be diminishing concern about assuring "computer literacy" for every student in the educational system. Although microcomputers will be used increasingly in offices, factories, and homes, it will not be necessary to have a school course to make reasonable use of the equipment. Units will become still more "user friendly" and people will learn to use and assimilate this technology as easily as they have several major earlier inventions, including the automobile.

3. One common forecast is that recurrent education or lifelong learning will become commonplace. While this may be the direction of change, it is doubtful that it will go as far or as fast as the conventional view suggests. First, one should distinguish lifelong learning as a recreational activity from recurrent education as a vocational imperative. Recreational learning will be one of many leisure activities of the aging population, and will stimulate demand for informal, noncredit courses such as are already common at schools and colleges. The direction will be for more of the same, but with consumer expectation of increasing quality. Concomitantly, the fees for these courses will increase significantly.

Recurrent education for vocational training will be less common than expected. This concept involves people interrupting their employment to return to classes for further skill training, but this would entail a considerable cost in terms of forgone earnings and possibly for relocation, maintenance, and ancillary expenses. If proposals for paid educational leave are implemented,[18] these costs would be shared or borne by employers and governments, but would still require substantial expenditures. The more likely development would have workers retrained on the job, with the school system providing some instructors and know-how.

4. More emphasis will be given to educational and occupational guidance as students face more diversity and uncertainty in their career choices.

Quantitative Directions: Students, Teachers, and Schools

5. It is an open question whether education at the senior secondary level will be interrupted or continuous. High unemployment rates and increasing private costs for postsecondary education could lead students to acquire and hold part-time jobs as a hedge for future employment, but students may

also try to accelerate educational programs to reduce costs and maximize chances for future employment.

6. The increasing labour force participation by mothers of young children will increase pressure for public provision and financing of day care-cum-schooling facilities for children aged 12 to 48 months.

7. One of the major innovations of the 1960s and 1970s was the introduction of "alternate schools". Despite a cyclical movement (if not a trend) to conservative, traditional schooling, the alternate schools will remain and grow in number. They serve an important function in the educational system: they respond to parents who seek more liberal - or even more traditional - forms of schooling, without transforming the entire system; they show that the system is flexible; and they provide small schools in response to the criticism that schools have become too large.

8. Notwithstanding a growth in numbers of alternate schools, private school enrolments will be an increasing fraction of the total. As the number of children per family decreases and there is greater emphasis on obtaining admission to universities (despite higher tuition fees), parents will be more willing to afford the rising cost of private education. This will also be a route for traditional families to avoid the effects of multiculturalism, minority rights, and special interest programs in the public system. In short, there will be reinforced efforts to preserve "the old school tie".

9. Teachers will be increasingly concerned about job security, merit pay, seniority rights, and early retirement (both pro and con). This will contribute to more labour unrest and strike activity, which in turn will have an adverse effect on the quality of recruits attracted to the teaching profession.

Administration and Control

10. Teachers and students will place greater emphasis on their "rights" - whether defined by the new Charter, collective agreements, or self-defined assertions.

11. As the province moves toward financing a larger part, then all of the costs at the elementary and secondary level, there will be efforts to integrate the administration and facilities of major secondary schools and their neighbouring community colleges.

12. Similarly, there will be further centralization or regionalization of school boards because larger boards can reallocate teachers and physical facilities in response to changing requirements, but the larger boards will also have special committees to deal with specialized local conditions resulting from unusual concentrations of ethnic groups or special education needs.

13. Schools will encounter increasing difficulty in dealing with vandalism, theft, drugs and alcohol, and personal assaults. Special police units, such as the development of community service officers, will play a greater role in assisting administrators to deal with these problems.

14. Similarly, more staff for psychological counselling will be provided to assist teachers and students in dealing with problems arising from more diversity in family structures and ethnic groupings.

Economics and Finance

15. Full provincial funding of public sector education will occur within the foreseeable future. The property tax has long and frequently been criticized as a base for financing education. With increasing inequity in

assessment practices, the aging of the population, geographic mobility of students and graduates, and finally the full public financing of separate schools, there will be more pressure than ever to provide the full cost of elementary and secondary education from the provincial budget. This will be achieved by a tax credit and transfer mechanism that show taxpayers their provincial tax increases are offset by municipal tax decreases.

16. There will be more community use of school facilities, but school boards, municipal councils, and the provincial government will seek other uses for the schools, the teaching staff, and the land, in terms of consultative services, multiple use or exclusive leasing of buildings, and potential redevelopment of buildings and land.

17. Since the majority of schools were constructed when the real cost of energy was at or near its lowest-ever level, schools are not energy-efficient. Future renovation or redevelopment will include both proven and experimental methods for energy conservation. Repair and maintenance expenditures will also be a larger share of operating expenditures as schools built during the 1950s and 1960s increasingly show the effects of age.

IV. Notes

1. W. Clark *et al*, *Class of 2001*, p. 15.
2. J. Newitt, p. 23.
3. A. Romaniuc, p. 13.
4. *Ibid*.
5. *Globe and Mail*, 15 February 1985, "Fertility study says birth rate ending decline".
6. *Ontario Statistics, 1984*, Table 3.25.
7. See for example, J. Dumas, p. 27.
8. *Ontario Statistics, 1984*, Table 3.27.
9. Statistics Canada, *Income Distribution by Size in Canada*, annual.
10. Ontario Manpower Commission, *Labour Market Outlook for Ontario: 1984-88*.
11. Economic Council of Canada, *Annual Review: 1984*, p. 82.
12. F.J. Fletcher and R.J. Drummond, *Canadian Attitude Trends, 1960-1978*.
13. Commission on Declining School Enrolments in Ontario, *Final Report*, and Ministry of Education, *Issues and Directions*.
14. *Education Statistics, Ontario, 1983*, Table 3.081.
15. See Statistics Canada, *Universities: Enrolments and Degrees*, annual; and *Ontario Statistics, 1984*, Table 31.18.
16. Ontario Ministry of Education, *Issues and Directions*, p. 11.
17. *Ibid*., pp. 4-7.
18. Canada Employment and Immigration Commission, report of the Task Force on Skills Development Leave, *Learning a Living in Canada*.

V. BIBLIOGRAPHY

Alberta. Commission on Educational Planning. A Choice of Futures: A Future of Choices. Edmonton: Queen's Printer, 1972.

Anisef, Paul, and Norman Okihiro. Losers and Winners. Toronto: Butterworths, 1982.

Atkinson, T. Trends in Life Satisfaction. Montreal: Institute for Research in Public Policy, 1979.

Baker, Walter (ed.) Shaping the Future: Canada in a Global Society. Ottawa: Centre for Policy and Management Studies, 1979.

Barney, G.O., P.H. Freeman, C.A. Ulinski. Global 2000: Implications for Canada. Toronto: Pergamon Press, 1983.

Barrett, Michael. Population and Canada (third ed.) Toronto: University of Toronto, 1982.

Bell, Daniel. The Coming of Post Industrial Society: A Venture in Social Forecasting. New York: Basic Books, 1973.

Bell, W., and J.A. Mau (eds.) The Sociology of the Future. New York: Russell Sage, 1971.

Berkowitz, S.D. (ed.) Models and Myths in Canadian Sociology. Toronto: Butterworths, 1984.

Bertin, Leonard. Target 2067. Toronto: Macmillan, 1968.

Bird, Richard M. and N.E. Slack. Property Tax Reform and Educational Finance in Ontario. Toronto: Commission on Declining School Enrolments in Ontario, 1978.

Botkin, J.W., et al. No Limits to Learning: a report to the Club of Rome. Toronto: Pergamon Press, 1979.

Bowman, J., et. al. The Far Side of the Future: Social Problems and Educational Reconstruction. Washington: World Future Society, 1978.

Buttrick, John A. Educational Problems in Ontario and Some Policy Options. Toronto: Ontario Economic Council, 1977.

Cameron, David M. Schools for Ontario. Toronto: University of Toronto Press, 1972.

Canada. Employment and Immigration Commission. Labour Market Developments in the 1980s. Ottawa: Supply and Services Canada, 1981.

______. ________________________. Learning a Living in Canada. (Report of the Skills Development Leave Task Force). Ottawa: Supply and Services Canada, 1979.

Canadian Education Association, Education in Transition, 1960-1975. Toronto: The Association, 1975.

Card, B.Y. Trends and Change in Canadian Society: Their Challenge to Canadian Youth. Toronto: Macmillan, 1968.

Clark, W., M.S. Devereux, Z. Zsigmond. The Class of 2001. Ottawa: Statistics Canada and the Canadian Teachers Federation, 1979.

Conference Board in Canada. The Provincial Economies. Ottawa: The Board, 1981.

Coombs, Philip N. The World Educational Crisis: A Systems Analysis. New York: Oxford University Press, 1968.

Croskery, Geo. C. and Gerald Nason (eds.) Addresses and Proceedings of the Canadian Conference on Education. Ottawa: Canadian Conference on Education, 1958.

Drouin, Marie-Josee, and B. Bruce-Briggs. Canada Has a Future. Toronto: McClelland and Stewart, 1978.

Dumas, Jean. Report on the Demographic Situation in Canada, 1983. Ottawa: Supply and Services Canada, 1984.

Dungan, Peter. Outlook for the Canadian Economy through 1995. Background paper for Centre for Industrial Relations Conference, November 1984.

Economic Council of Canada, Steering the Course: Twenty-First Annual Review. Ottawa: Supply and Services Canada, 1984.

Evans, W.G.E. (ed.) Class of '84. Toronto: Canadian Institute on Public Affairs, 1964.

Fleming, W.G. Education: Ontario's Preoccupation. Toronto: University of Toronto Press, 1972.

Fletcher, F.J. and R.J. Drummond. Canadian Attitude Trends, 1960-1978. Montreal: Institute for Research on Public Policy, 1979.

Foot, David. Resources and Constraints: Public Education and the Economic Environment in Ontario, 1978-1987. Toronto: Commission on Declining School Enrolments in Ontario, 1978.

__________. Canada's Population Outlook: Demographic Futures and Economic Challenges. Ottawa: Canadian Institute for Economic Policy, 1982.

Gappert, Gary. Post-affluent America: The Social Economy of the Future. New York: New Viewpoints, 1979.

Gayfer, Margaret. An Overview of Canadian Education. Toronto: Canadian Education Association, 1978.

Hall, Oswald, and Richard Carlton. *Basic Skills at School and Work*. Toronto: Ontario Economic Council, 1977.

Harris, Robin. *Quiet Evolution: A Study of the Educational System of Ontario*. Toronto: University of Toronto Press, 1967.

Hawken, Paul, J. Ogilvy, Peter Schwartz. *Seven Tomorrows*. New York: Bantam, 1982.

Husen, Torsten. *Present Trends and Future Developments in Education: A European Perspective*. Toronto: Ontario Institute for Studies in Education, 1971.

Illich, Ivan. *Deschooling Society*. New York: Harper and Row, 1971.

Kahn, Herman. *The Coming Boom*. New York: Simon and Schuster, 1982.

___________, Wm. Brown, Leon Martel. *The Next 200 Years: A Scenario for America and the World*. New York: Morrow, 1976.

Kalbach, W.E., and W.V. McVey. *The Demographic Bases of Canadian Society*. Toronto: McGraw-Hill, 1971.

Kettle, John. *The Big Generation*. Toronto: McClelland and Stewart, 1980.

Little, Dennis L., and Theodore J. Gordon. *Some Trends Likely to Affect American Society in the Next Several Decades*. Middletown, Conn.: Institute for the Future, 1971.

Livingston, David, et al. *Public Attitudes toward Education in Ontario*. Toronto: O.I.S.E., 1980, and 1985.

MacLeod, Betty. *The Development of Improved Bases for Forecasting School Age Population Throughout Ontario*. Toronto: O.I.S.E., 1978.

McDiarmid, Garnet (ed.) *From Quantitative to Qualitative Change in Ontario*. Toronto: Ontario Institute for Studies in Education, 1976.

Meadows, D.H., D.L. Meadows, Jorgen Randers, Wm. Behrens. *The Limits to Growth*. New York: Universe Books, 1972.

Monroe, David. *The Organization and Administration of Education in Canada.* Ottawa: Information Canada, 1974.

Naisbitt, John. *Megatrends: Ten New Directions Transforming our Lives*. New York: Warner Books, 1982.

Newitt, Jane (ed.) *Future Trends in Education Policy*. Lexington, Mass.: Lexington Books, 1979.

Ontario. Commission on Declining School Enrolments in Ontario. *Interim Report*. Toronto: Ministry of Education, 1978.

_______. ____. *Second Interim Report*. Toronto: Ministry of Education, 1978.

_______. ____. *Final Report*. Toronto: Ministry of Education, 1978.

______. Committee on the Costs of Education. Planning and Demographic Influences on School Enrolment, Interim Report No. Four. Toronto: The Committee, 1974.

______. Ministry of Education. Education Statistics, Ontario. Toronto: the Ministry, annual.

______. ____________________. Ontario Elementary and Secondary School Enrolment Projections. Toronto: the Ministry, 1984.

______. ____________________. Towards the year 2000: Future conditions and strategic options for the support of learning in Ontario, Review and Evaluation Bulletin, 5(1), 1984.

______. ____________________. Review of Educational Policies in Canada: Ontario. Toronto: the Ministry, 1975.

______. ____________________. Issues and Directions: the response to the final report of the Commission or Declining School Enrolments in Ontario. Toronto: the Ministry, 1980.

______. Ministry of Treasury and Economics. Ontario Statistics. Toronto: the Ministry, annual.

______. Ministry of Treasury, Economics and Intergovernmental Affairs. Effect of Demographic Change on Enrolment and School Facilities to Year 2001. Toronto: the Ministry, 1978.

______. Provincial Committee on Aims and Objectives of Education in the Schools of Ontario. Living and Learning. Toronto: Newton Publishing, 1968.

______. Royal Commission on Education in Ontario. Report. Toronto: King's Printer, 1950.

Ontario Economic Council. Issues and Alternatives, 1976, Education. Toronto: the Council, 1976.

____________________. The Ontario Economy to 1987. Toronto: the Council, 1977.

Ontario Manpower Commission. Labour Market Outlook for Ontario: 1984-88. Toronto: the Commission, 1984.

Organization for Economic Cooperation and Development. Review of Educational Policies in Canada. Paris: O.E.C.D., 1976.

____. Long-range Policy Planning in Education. Paris: O.E.C.D., 1973.

Overbeek, Johannes. *Population and Canadian Society*. Toronto: Butterworths, 1980.

Picot, Garnett. *The Changing Education Profile of Canadians, 1961 to 2000*. Ottawa: Statistics Canada, 1980.

Price, Fred W. (ed.) *The Second Canadian Conference on Education: A Report*. Toronto: University of Toronto Press, 1962.

Romaniuc, A. *Fertility in Canada: From Baby-boom to Baby-bust*. Ottawa: Supply and Services Canada, 1984.

Selby-Smith, C. and M. Skolnik. *Concerning the growth of provincial expenditure on education in Ontario, 1938-1966*. Occ. paper no. 3. Toronto: O.I.S.E., 1969.

Shane, Harold G. *The Educational Significance of the Future*. Bloomington, Ind.: Phi Delta Kappa, 1973.

Stager, David. *Elementary and Secondary School Teachers' Salaries in Ontario, 1900 to 1975*. Toronto: Commission on Declining School Enrolments in Ontario, 1978.

Statistics Canada. *On the Move: Results of a Special Survey on Migration*. Ottawa: Statistics Canada, 1983.

______________. *Education in Canada: A Statistical Review for the Period 1960-61 to 1970-71*. Ottawa: Information Canada, 1973.

______________. *Perspective Canada III*. Ottawa: Supply and Services Canada, 1980.

Stone, Leroy O., and Claude Marceau. *Canadian Population Trends and Public Policy Through the 1980s*. Montreal: Institute for Research on Public Policy, 1977.

Swift, W.H. *Trends in Canadian Education* (Quance Lectures) Toronto: Gage, 1968.

Tait, Janice J. Educational planning for the future. *McGill Journal of Education*. XII (1977) 1, 133-146.

Toffler, Alvin. *The Third Wave*. New York: Morrow, 1980.

Watson, Cicely, and Saeed Quazi. *Projections of Enrollment and Teacher Supply*. Toronto: O.I.S.E., 1980 (annual).

Wilson, J.D. (ed.) *Canadian Education in the 1980s*. Calgary: Detselig, 1981.

__________, R.M. Stamp, L.-P. Audet (eds.) *Canadian Education: A History*. Scarborough, Ont.: Prentice-Hall, 1970.

Zsigmond, Z., et al. *Out of School - Into the Labour Force*. Ottawa: Statistics Canada, 1978.

________________. *Future Trends in Enrolment and Manpower Supply in Ontario*. Ottawa: Statistics Canada, 1977.